February 1942

THE FOUNDRY

FIFTIETH YEAR

CHNOLOGY DEPT.

PUBLIC LIBRARY
FEB 3 - 1942
DETROIT

We're Shipping

12 24-HOUR Shipments

BLACK HILLS BENTONITE

Right Away!

We're shipping all orders for Black Hills Bentonite within 24 hours—and for all our other lines, too . . . Black Hills Bentonite is a colloidal bentonite unsurpassed in quality. It comes from our *owned* deposits in South Dakota, which are virtually inexhaustible. It is processed as only the most modern and complete facilities can do it, supported by continuous laboratory control. Black Hills Bentonite will give you the finest results.

—*PROVIDED* it fits your job. Whether it does or not is a question which our six service engineers will be glad to help you decide. With five different bonding clays and many combinations to draw upon, they can and will present an unbiased report. With an average of 14 years' experience to guide them, they will point the way to *better molds, better castings, less scrap and most bonding strength per dollar* of your investment.

"ECP" has hired another service man to travel full time, study your needs first hand and recommend the *one right bonding clay* for your purpose.

EASTERN CLAY PRODUCTS, INC., EIFORT, OHIO

DIRECT SALES OFFICES:

Detroit—510 United Artists Building; *Buffalo*—228 Highgate Ave.; *Philadelphia*—6483 Morris Park Road; *New England Office*—33 Bass St., Wollaston, Mass.

ECP *All* TYPES OF BONDING CLAYS

A Foundry Sand Service Based Upon Practical Research

ukee.....Walter Gerlinger, Inc.
go.....Western Materials Co.
nooga.....Porter Warner
ngeles..H. C. Donaldson & Co.
ncisco..H. C. Donaldson & Co.
rel.....Webster & Sons, Limited
rapolis.....E. R. Frost & Co.

UNIFORMITY...even with 100% scrap mixtures

Even with most careful control of cupola operations there are times when the metal goes off-grade at the spout. This may be caused by variations in the cupola charge which are unavoidable in commercial foundry practice, or by variations in melting conditions. Good foundry practice presupposes taking every precaution to prevent or offset the effects of variables in cupola practice upon production and quality of the finished casting.

By using Purite in the cupola, which helps to increase melting temperature, and by treating the iron in the spout with a graphitizer, which acts to prevent chilling, the effects of wider variables normally occurring with high scrap mixtures can usually be more than offset. In fact, with correct Purite treatment some improvements in the pouring character of the molten iron and in the quality of finished castings, as compared to pig iron mixtures untreated, can be expected even with the use of 100% scrap mixtures.

Used in the cupola with the limestone charge, Purite produces a more fluid active slag which improves melting conditions and reduces sulphur pick-up in the cupola. It prevents oxidation of the metal charge and finally forms a more active refining slag in the hearth of the cupola. Used in a teapot ladle, which serves to flatten out variations, Purite, by reducing sulphur and washing out non-metallic impurities, refines the iron to virgin quality. Thus Purite acts both to smooth out variations in cupola operations and to eliminate the impurities inherent in high scrap mixtures.

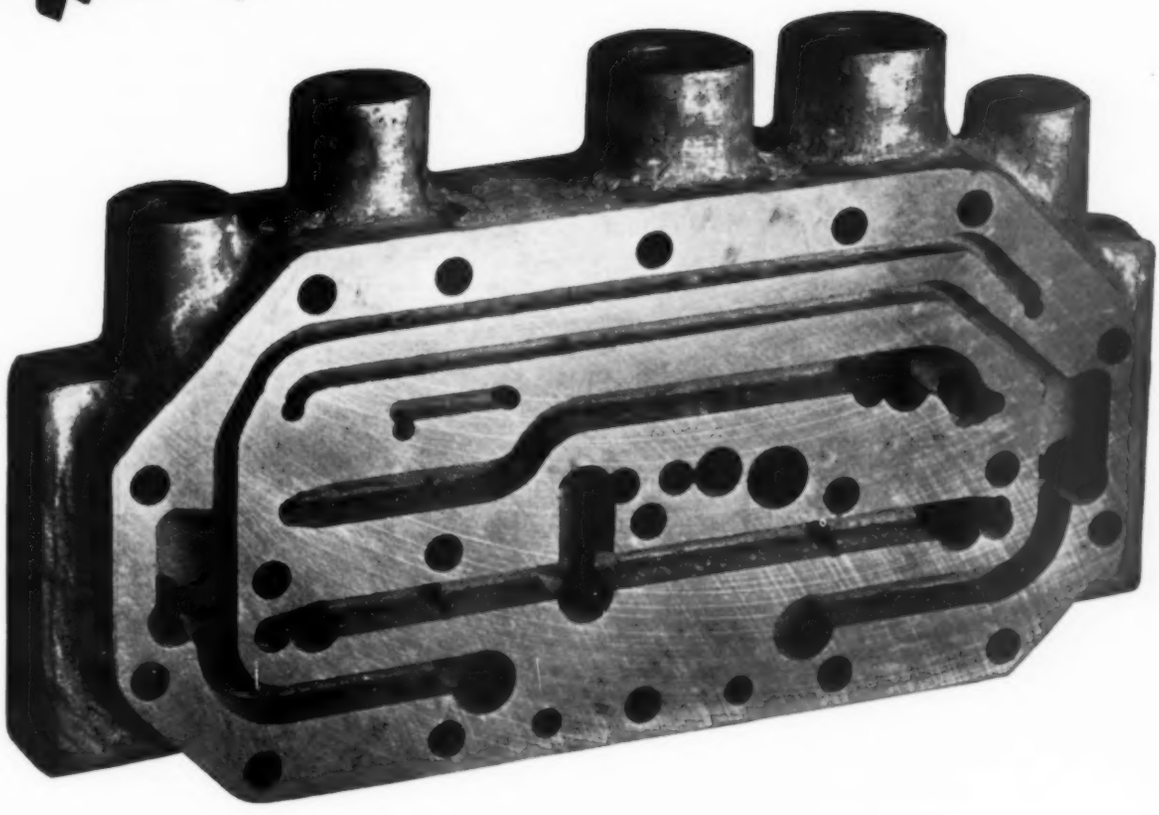
Write for MATHIESON Bulletin P41 "REFINING AND DESULPHURIZING CUPOLA IRON WITH PURITE".

PURITE

THE SCIENTIFIC FLUX FOR BETTER MELTING AND CLEANER IRON

THE MATHIESON ALKALI WORKS (INC.)
60 EAST 42ND STREET, NEW YORK, N. Y.
(Licensee of Metallurgical Development Company, Inc.)

AN IRON BRAIN



Silvery Mayari

This hydraulic valve is the brain of a highly complicated industrial machine. The internal channels are filled with oil, pressure is exerted and a whole series of complicated mechanisms start moving—without guidance of human hands.

Hydraulic valves like this one are hard at work in our 1942 war-production machine.

Silvery Mayari alloy iron is widely used in producing such castings because of the superior strength, soundness and machinability which Silvery Mayari insures.

Right now, there is an increasing demand for Silvery Mayari for use in the vital tools of war. For us, as for other companies, the production of war materials is the big job that takes precedence over everything else.

However, we haven't any shortage on foundry experience or the desire to help our friends. If you have an alloy-iron casting problem and want to talk it over with a trained engineer, let us know. A Bethlehem foundry specialist will be glad to call upon you without obligation.

BETHLEHEM STEEL COMPANY

BETHLEHEM STEEL

What's the Truth About Foundry Facings?

WITH priorities and allocations becoming more prevalent week by week, many foundrymen are wondering: "What about some of the items that are not on critical lists now? Will we be able to continue securing them from our present source? Or will some of them become scarce?"

The following is our answer to those questions: Let us make Federal's position clear. Our business is foundry supplies—we prosper only as the foundries prosper. Accordingly, it is to our interest—as well as that of our customers—to endeavor to always have what foundries want *when* they want it. We have been and will continue to cooperate 100% with our country's Victory Program.

Here's how we stand on some of the major foundry supplies:

SEACOAL—There is still plenty of coal, and Federal's capacity is at least 50% greater than present production which, incidentally, is the greatest in Federal's history. We are now erecting a new modern mill which promises even more production for Federal customers. There is no "seller's market" on seacoal—no excuse for anything but a very short delay on an occasional order. We offer Charleroi Seacoal with the entire Federal facilities behind this statement: "You can't buy a better seacoal than Charleroi!"

CORE WASH—Whether you use Champion, Super, Special Acme, or any other Federal brand core wash, we assure you that you *will* be able to continue using it. A large part of Federal's reputation for quality products has resulted from our extensive research and exacting laboratory control of core washes and we intend to protect all users of those products. This is our pledge to every one of our customers and our entire facilities are behind that pledge.

PARTINGS—At the present time, no critical materials are involved in the manufacture of Federal Partings, whether Non-Silica or the famous Triple-Ground. Our manufacturing facilities are more than ample and we see no prospect of any immediate change in our ability to ship all orders promptly.

GREEN BOND—The success of Federal's pioneering efforts with Federal Green Bond (Wyoming Bentonite) more than 15 years ago has inspired much imitation. What Green Bond offers that imitating products don't, can best be summed in two words: experience and capacity.

Experience is a dear teacher but also the *best*. Every representative who sells Federal Green Bond has behind him our accumulated experience of more than 15 years mining, drying and pulverizing the ideal sand bonding agent. Every foundry that uses it gains the advantage of that experience with every bag.

There are many ways in which we could state our capacity. Perhaps the best way is this: Alone and unaided, our huge plant at Upton, Wyoming, could supply all the bentonite for every large foundry in this country!

PLUMBAGO—The Japanese stab in the back has complicated the situation on Ceylon Graphite—the backbone of every good plumbago. The cheerful side of the graphite picture for Federal's customers is our huge stock—the largest in the Company's history—plus our determination never to lower the standard of Federal Plumbagos. We intend to keep them the best you can get at any price.

Summarizing, we believe that we shall be able to care for all our customers in 1942 exactly as usual. Unforeseen events may alter some of the above statements, but the above is the picture as we see it now. We believe that part of our job is giving foundrymen this frank statement.

IT'S FEDERAL FOR '42
EVERYTHING SOLD WITH SERVICE

The FEDERAL FOUNDRY SUPPLY COMPANY

4600 East 71st Street • Cleveland, Ohio

(Seacoal Plant) CHARLEROI, PA. CHICAGO CHATTANOOGA, TENN. DETROIT MILWAUKEE MINNEAPOLIS NEW YORK ST. LOUIS RICHMOND, VA. (Mines) UPTON, WYO.

THE FOUNDRY

Editorial Staff

FRANK G. STEINEBACH
Editor

PAT DWYER
Engineering Editor

EDWIN BREMER
Metallurgical Editor

DON S. CADOT
Art Editor

B. K. PRICE
New York . . L. E. BROWNE

Chicago . . . . E. F. ROSS
Detroit . . . A. H. ALLEN
Pittsburgh . . . R. L. HARTFORD
Washington . . L. M. LAMM
London . . VINCENT DELPORT

Advisory Staff

JOHN W. BOLTON
ALBERT E. GROVER
JOHN HOWE HALL
N. K. B. PATCH
HARRY A. SCHWARTZ

Business Staff

J. M. LATHROP
Advertising Manager

R. C. WELLMAN
Circulation Manager

New York . . . . J. F. AHRENS
Chicago . . . . . L. C. PELOTT
G. A. POPE

Pittsburgh . . . . . S. H. JASPER
Cleveland . . . . A. L. KLINGEMAN

MAIN OFFICE

Penton Building, Cleveland, Ohio

BRANCH OFFICES

New York . 110 East 42nd Street
Chicago . 520 North Michigan Avenue
Pittsburgh . . Koppers Building
Washington . National Press Building
Detroit . . . 6560 Cass Avenue
London . . . . 2, Caxton Street
Westminster, S.W. 1.

THE FOUNDRY is published monthly by The PENTON PUBLISHING CO., Penton Building, 1213 West Third street, Cleveland, O. EARL L. SHANER, President and Treasurer; GEORGE O. HAYS, Vice President and FRANK G. STEINEBACH, Secretary.

Subscription: In the United States and possessions, Canada, Cuba, Mexico, Central and South America,—one year, $2.00; two years, $4.00; three years, $5.00. All other countries, one year, $4.00. Single copies 25 cents. Copies published three months or more previous to date of current issue, 50 cents.

Member: Audit Bureau of Circulations, Associated Business Papers, National Publisher's Association.

Copyright 1942 by THE PENTON PUBLISHING CO.

Entered as second class matter at postoffice at Cleveland under the act of March 3, 1879.

CONTENTS

VOLUME 70 **FEBRUARY, 1942** *NUMBER 2*

	PAGE
Editorial	57
Training Apprentices in the Laboratory *By H. R. McCoy*	58
Foundry Congress To Speed Production for Victory	61
Casting Guns Centrifugally at Watertown *By Brig. Gen. R. W. Case*	62
Porosity in Aluminum Castings *By William Wilson Jr.*	64
Foundry Industry Girds to Meet War Demands	66
Improving Cupola Performance *By Don J. Reese*	68
Planning the Nonferrous Foundry *By N. K. B. Patch*	70
Interesting Technique Used on Large Motor Casting *By R. L. Hartford*	71
Questions and Answers	72
Men of Industry	76
The Adventures of Bill *By Pat Dwyer*	80
Among Detroit Foundries *By A. H. Allen*	84
Comment	89
Activities of Foundry Groups	92
Readers' Comment	117
New Foundry Equipment and Supplies	118
Foundry Developments at Short Range	125
Foundry Activities	126
Lining the Cupola with Firestone *By Sidney G. Koon*	128
Obituary	132
Where-to-Buy Directory	161
Index to Advertisers	188

Pour 38 tons of molten metal with never a thought of loss

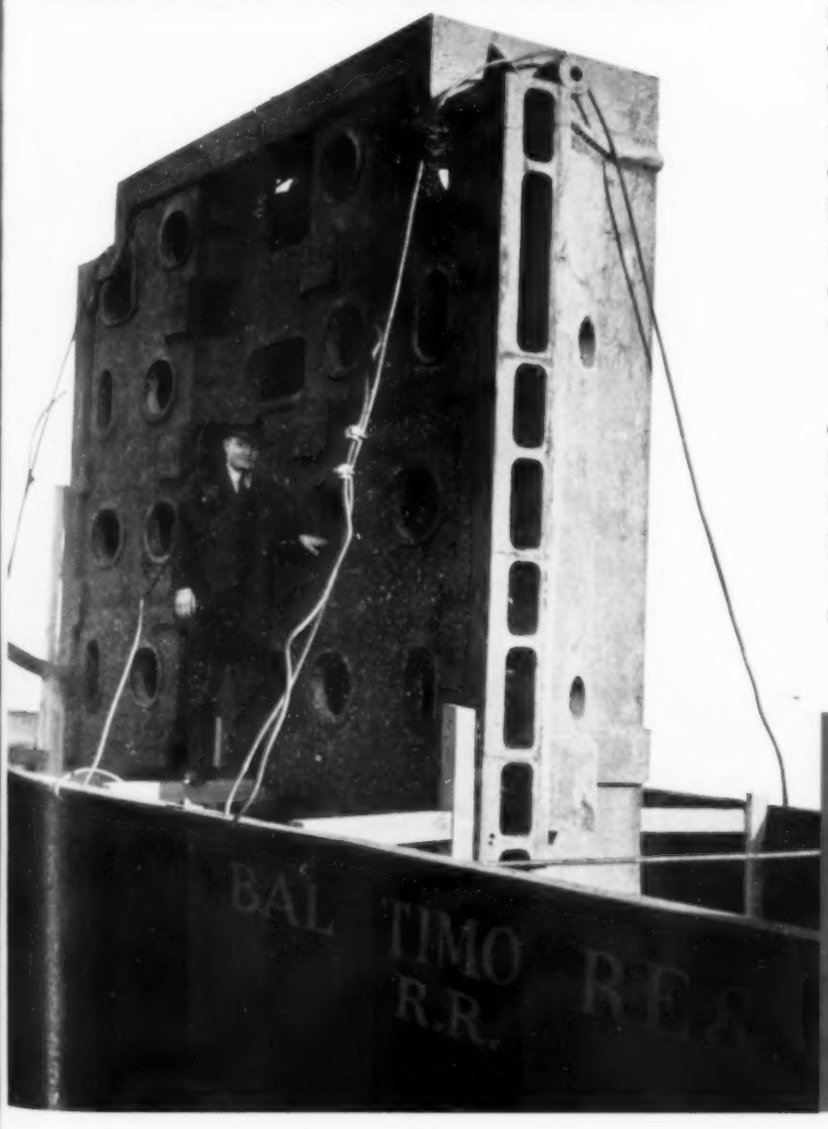
Yes, more than that, for 38 tons is the shipping weight of the hobbing machine base shown here as mold, pour, and casting

THE best of rules is: the best of tools when a difficult job comes up, and fortunate indeed is the foundry geared to Linoil in these days of exacting demands and speed-up delivery. Linoil is preparedness for what may come. Linoil is insurance against bottlenecking production by a binder. Linoil was made for foundrymen, and it suits them. They are so sure about it they will stand right up and say so. So sure about it they stake their foundries' production upon it—pour without hesitation 38 tons of metal into a mold made up of cores, walls and all, of Linoil.

LYNCHBURG FOUNDRY CO.
RADFORD, VIRGINIA

Takes the "if" out of difficult castings with Linoil, and they do such an outstandingly fine job of it that their castings go to far distant points. This huge casting, bound for New York state, comes from the Linoil mold and cores sound and perfect, and as smooth as if machined. "We always use Linoil and are always pleased with its performance," says Macon Miller, Works Manager of the Radford Plant.

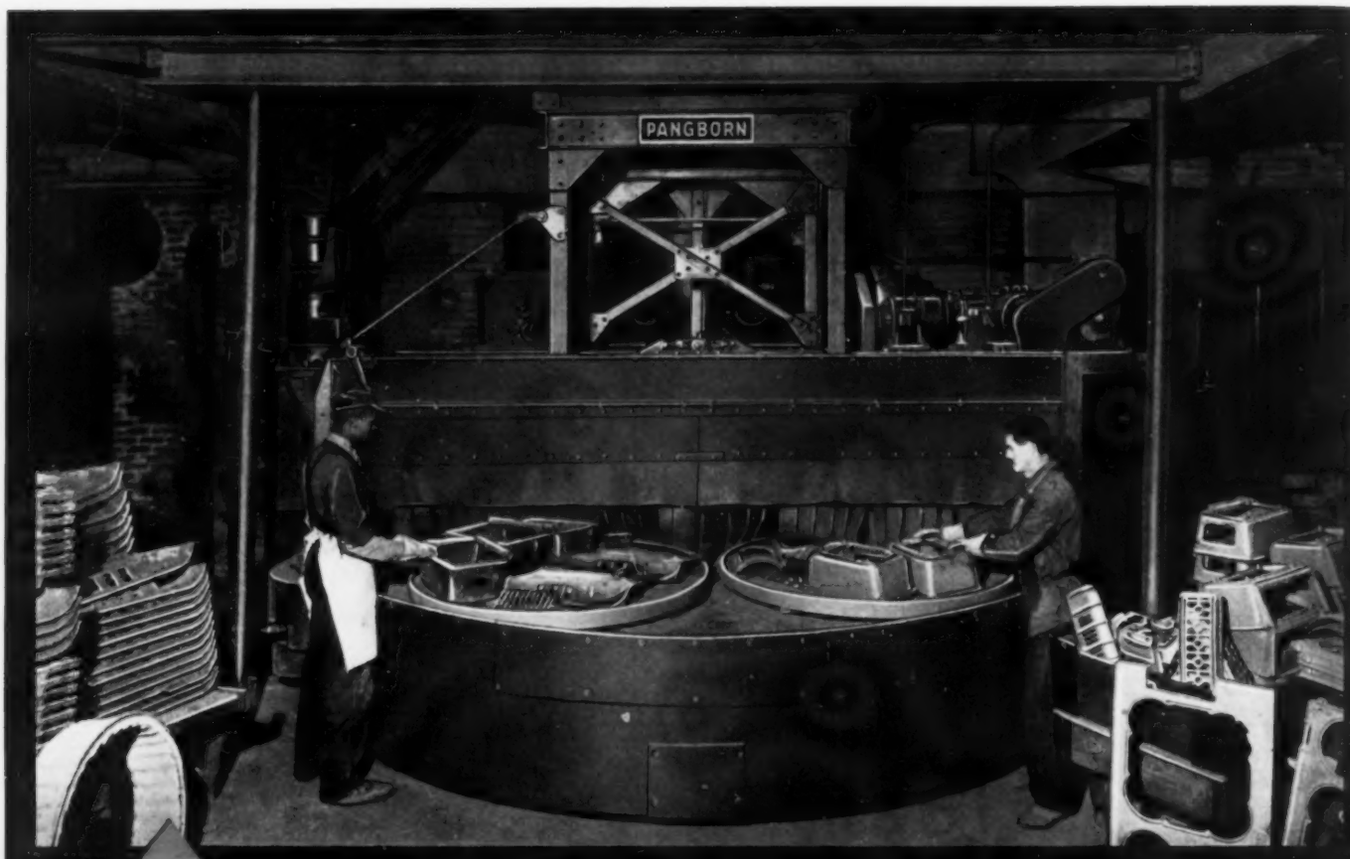
LINOIL



When the metal starts to run into a huge and expensively assembled mold it is a fine and heart-warming feeling to realize that your cores can take it, that when the iron has cooled the burned cores will come gushing out with a tap of a hammer saving hours of hand cleaning and that when the inspectors get through with the casting it most likely will be marked with a beautiful "OK."

It isn't so much what we say about our own product that is impressive—it is what the other fellow says about it and what he is doing with it. The pictures here, the pictures in the past, the things the users say, that is the story and the truth about Linoil.

THE
WERNER
G. SMITH
COMPANY
(DIVISION OF
ARCHER-DANIELS-MIDLAND COMPANY)
2191 WEST 110th ST., CLEVELAND, O.



FRONT VIEW

This is the 14 foot Multiple Spindle Blast Cleaning Table with two ROTOBLAST units. It has 5 Auxiliary Tables, each 50 inches in diameter.

*Name upon request

5,347 POUNDS

ROTOBLAST Table replaces

HERE is a recent ROTOBLAST Table installation that has completely revolutionized the cleaning of large and small castings in a well known southern Stove foundry.* Sturdily built—powerful—this 14 foot Multiple Spindle ROTOBLAST Table thoroughly cleans an average of 5,347 pounds of light and medium stove work per hour. Peak production for an 8 hour shift reached 65,000 pounds.

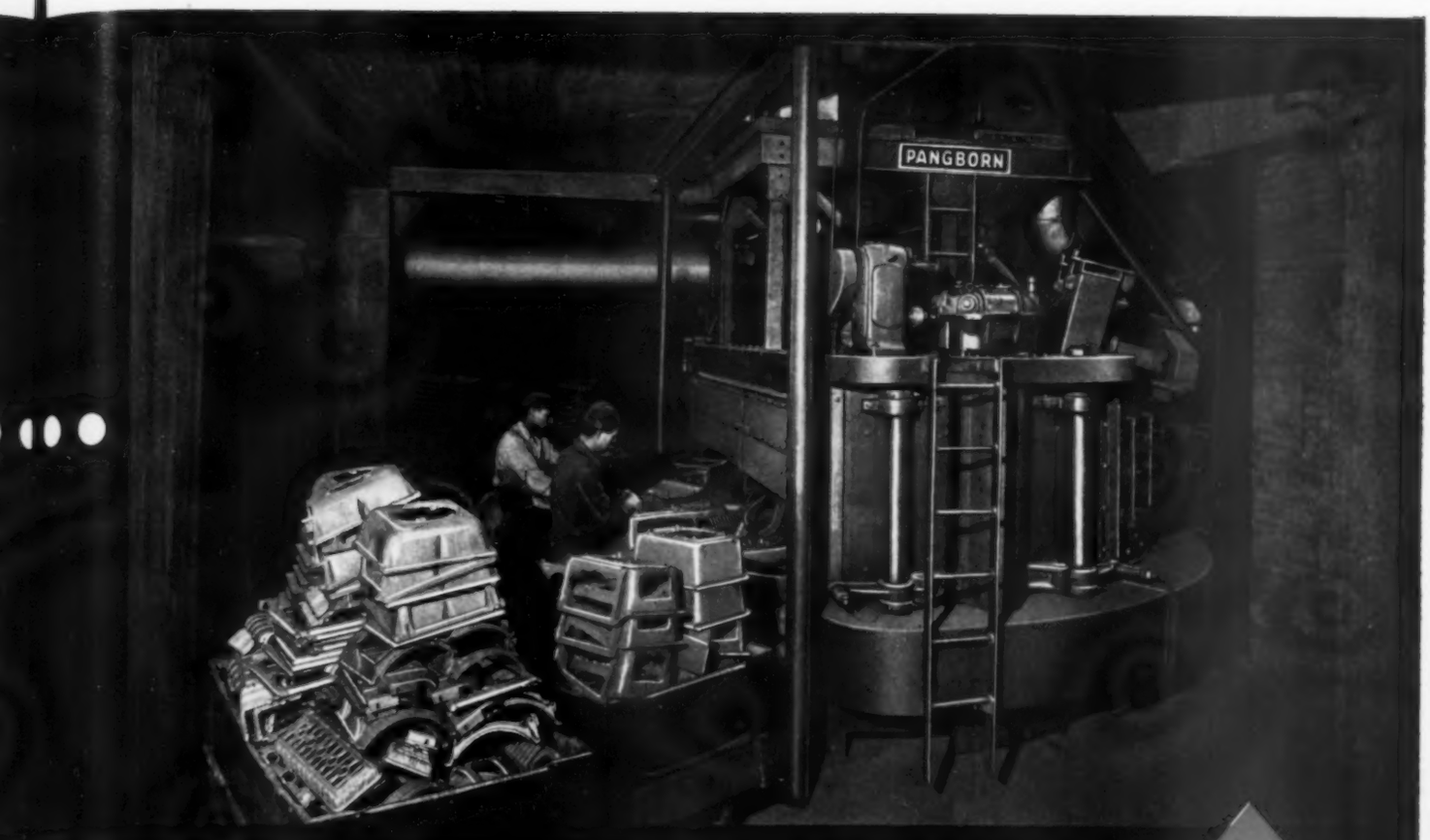
This new airless ROTOBLAST Table replaces 23 tumbling mills. After 30 days continuous operation the following facts are apparent—all of which contribute to the new low cleaning cost—

- **ELIMINATION OF LONG TUMBLING TIME.**
  Saves power. More work handled.

PANGBORN CORPORATION
HAGERSTOWN
MARYLAND

"THUMBS UP FOR DEFENSE"

PANG



CLEANED PER HOUR

*23 tumbling mills!**

- **ELIMINATION OF HIGH PERCENTAGE OF BREAKAGE.**
  Saves waste. Increases production.
- **INCREASES QUALITY OF FINISHED WORK.**
  Pleases customers. Brings repeat orders.

For high speed, economical blast cleaning — choose Pangborn ROTOBLAST equipment because of its performance record. "Thumbs up" determination of our organization make ROTOBLAST Tables, Barrels and Special Cabinets available for defense work in ever shortening time. Let us help you speed up your production. Wire for representative.

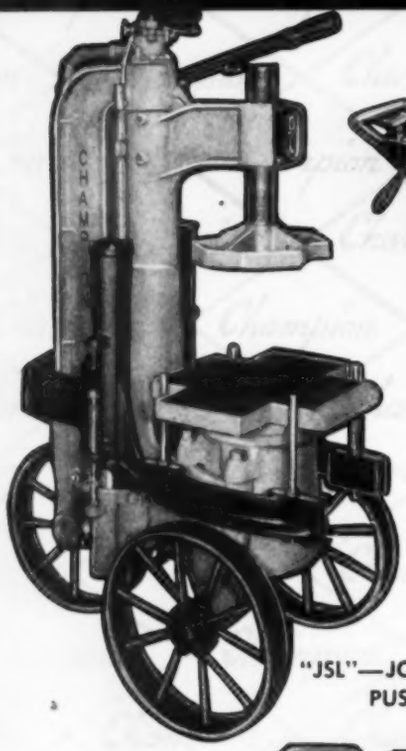
SIDE VIEW

Variable speed of Main Table ranges from 1 revolution in 1 1/3 minutes to 1 revolution in 12 minutes. The Tables accommodate work up to 18 inches in height. Maximum load on each Table—800 pounds.

BORN

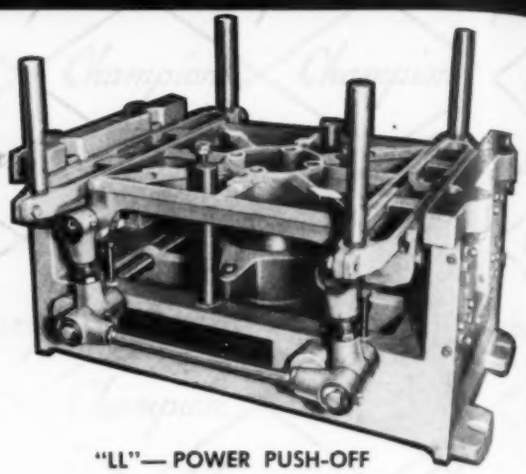
WORLD'S LARGEST MANUFACTURER OF BLAST CLEANING AND DUST CONTROL EQUIPMENT

"THUMBS UP FOR DEFENSE"



"JSL"—JOLT SQUEEZE PUSH-OFF

"JM"—JOLT ROLLOVER DRAW



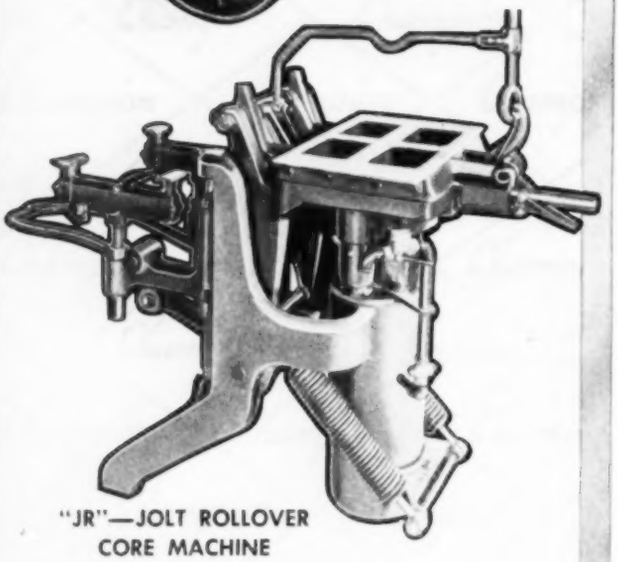
"LL"—POWER PUSH-OFF

THERE IS NO SUBSTITUTE FOR EXPERIENCE

Why not take advantage of our forty-four years experience in the design and manufacture of production molding and core machines.

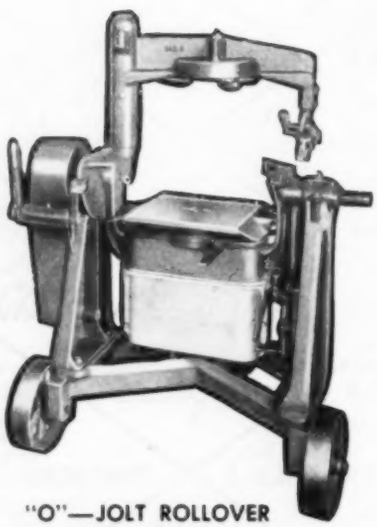
CHAMPION offers you reliable engineering service without obligation. It is our job to study your molding and core production problems and make proper recommendations.

Here are shown a few of the many types of molding and core machines we manufacture.

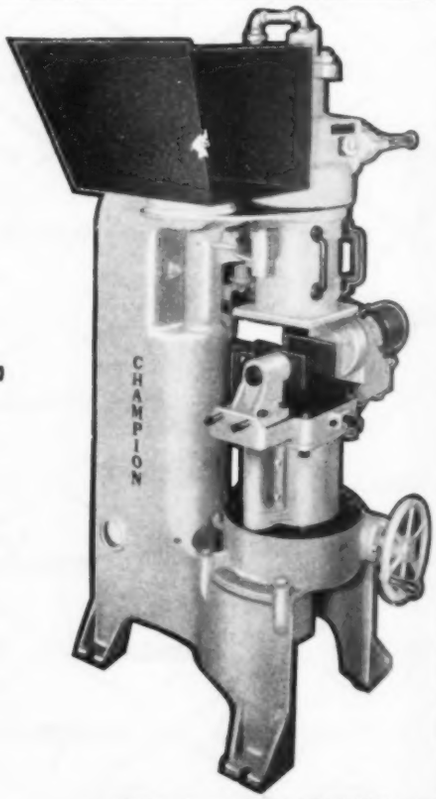


"JR"—JOLT ROLLOVER CORE MACHINE

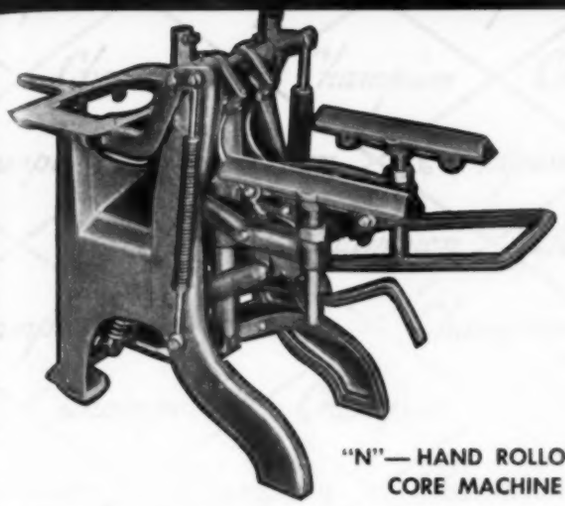
"JS"—PORTABLE JOLT SQUEEZER



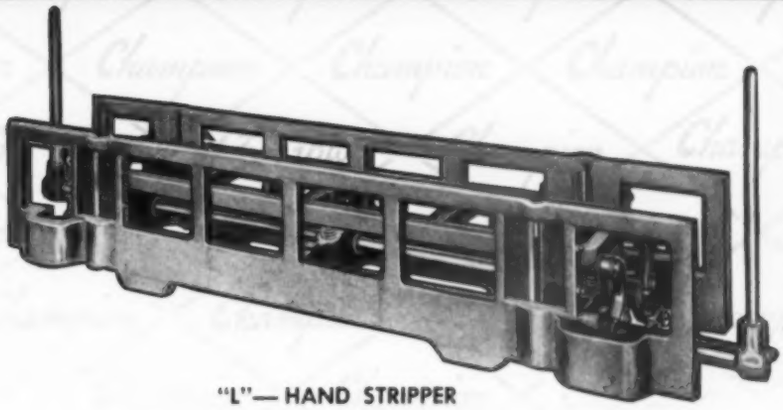
"O"—JOLT ROLLOVER CORE MACHINE



"CB"- 8 — CORE BLOWER



"N"— HAND ROLLOVER CORE MACHINE



"L"— HAND STRIPPER

Every installation by CHAMPION is unconditionally guaranteed.

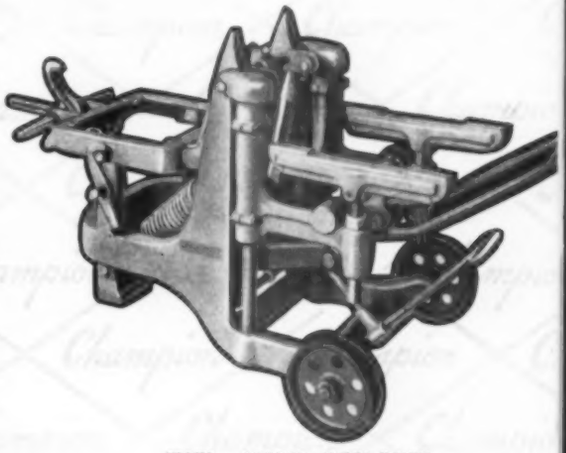
We don't mean guaranteed merely "against defects in workmanship or materials" either. We mean that your installation of CHAMPION equipment will be guaranteed to do the job you expect it to do, in the manner you want it done — in other words you must and will be 100% satisfied.

Yours for Defense

CHAMPION FOUNDRY & MACHINE COMPANY

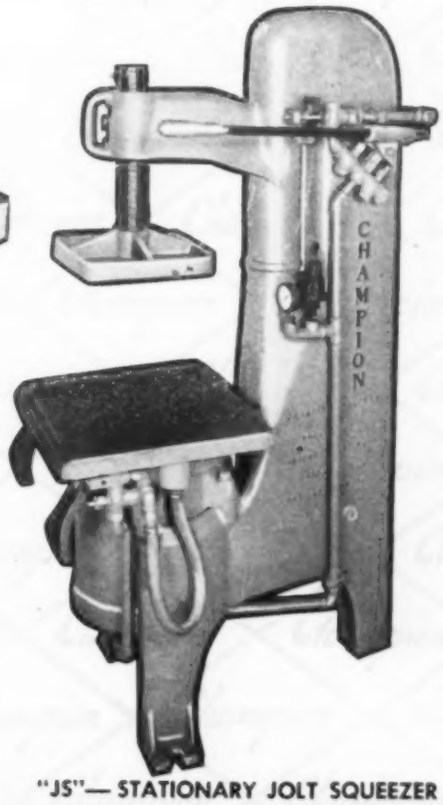
1318 WEST 21st STREET • CHICAGO, ILLINOIS

Manufactured in Canada by John T. Hepburn, Ltd., Toronto, Canada

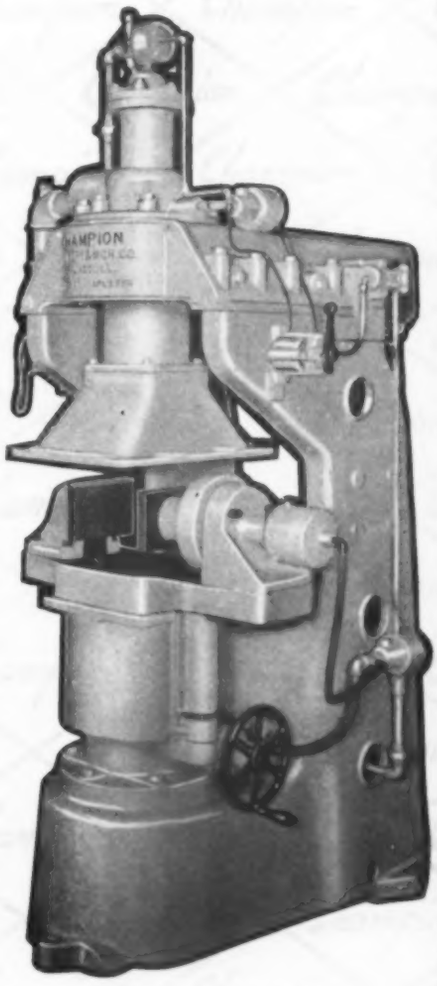


"W"— HAND ROLLOVER

"C"— PLAIN JOLT



"JS"— STATIONARY JOLT SQUEEZER



"CB"-10 — CORE BLOWER

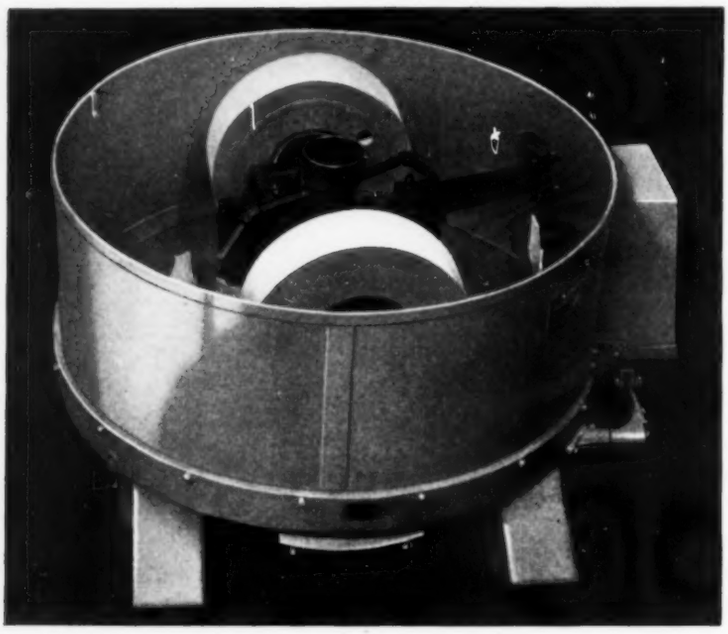
IMPROVED PRODUCT QUALITY

INCREASED PRODUCTION

GREATER ECONOMY

3 Good Reasons for Using SIMPSON INTENSIVE MIXERS and AUXILIARY EQUIPMENT

ASK any foundryman who has used Simpson Intensive Mixers for the preparation of all classes of foundry sand, what results could be definitely credited to the installation of these modern machines. Chances are he'd name the three important advantages listed here—and sum them all up by saying that Simpson Mixers, together with auxiliary equipment, were responsible for the *lowest cost per ton of good castings produced.*



No. 3—8 ft. diam. pan Simpson Intensive Mixer; a hi-duty unit used in scores of foundries for turning out "ton-plus" batches with required regularity and uniformity. Unit shown is equipped with air-operated double discharge mechanism, capacity up to 45 tons per hour.

Why? Simply because the use of Simpson Mixers and auxiliary equipment helps to solve the foundryman's toughest problem — correct preparation and control of all sands, to assure the highest possible percentage of good castings — free from sand defects, cleaner, smoother, and produced with a minimum of new sand or bond.

Here, then, is a method of increasing production for *all* types of foundries . . . a method that you cannot afford to overlook.

Shown on the opposite page are types of auxiliary equipment available for use with Simpson Intensive Mixers. These units are specially designed for service on sand, to permit proper cleaning, to remove metallic and other refuse, to reduce dust hazard and permit fines control, to cool the sand, and to fluff up the sand after mulling in Simpson Mixers.

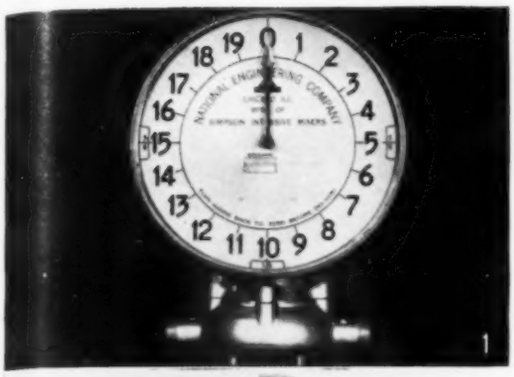
This complete line of equipment, plus specialized foundry engineering service is offered exclusively by National Engineering Co. Why not take advantage of this combination? Write for full details today.

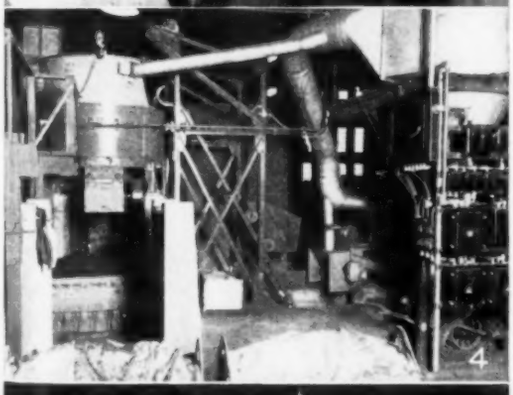
SIMPSON INTENSIVE MIXERS

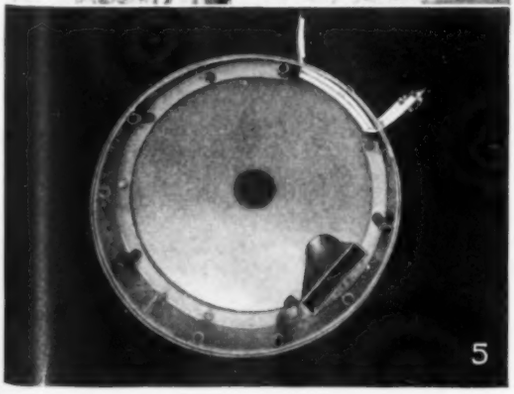
NATIONAL ENGINEERING COMPANY

MACHINERY HALL BUILDING • CHICAGO, ILLINOIS

Manufacturers and Selling Agents for Continental European Countries:—The Georgs Fischer Steel & Iron Works, Schaffhausen, Switzerland. For the British Possessions, Excluding Canada and Australia—Asquith Limited, Halifax, England. For Canada—Dominion Engineering Co., Ltd., Montreal, Canada. For Australia and New Zealand—Gibson, Battle & Co., Pty., Ltd. Sydney, Australia







1. LIQUID METERS: Used for measuring accurately the amount of water or oil required for each batch of sand. Equipped with manual re-set, but may be hooked up for automatic operation if desired.

•

2. MEASURING HOPPERS: Traveling or stationary measuring hoppers, with or without scales, to measure batches correctly for the various Mixer sizes, available for manual or semi-automatic operation.

•

3. NATIONAL TIME-MASTER: Provides completely automatic loading and discharge. These units operate solenoids for actuating loading and discharge doors, liquid, bond and sand additions, and complete cycles. Fitted with dust-proof case, it may be set and locked.

•

4. NATIONAL SCREENING AND MAGNETIC UNIT: For screening and removal of metallic refuse, this unit is used to clean the sand. Complete with vibrating screen and magnetic pulley, it may be housed and exhausted, similar to all National equipment.

•

5. MOISTURE-SPRAYING DEVICE: All Simpson Mixers except the smaller units are equipped with water funnels, but on many sands, it is desirable to spray liquids into the mix. This spray unit is fitted to the mixer, and connected to the liquid supply by means of a revolving joint.

•

6. NATIONAL AERATORS: For fluffing and aerating mulled sand during discharge. The Simpson is the *only* Mixer that can be equipped with an automatic aerator. These units are furnished complete with V-belt drive and motor.

•

7. EXHAUST SYSTEMS: Designed and built to reduce dust hazard and to permit control of the fines in the sand.

•

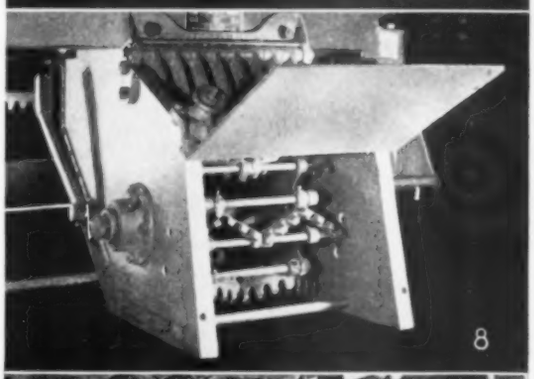
8. SAND AND MOLD HANDLING EQUIPMENT: Typical complete National sand reclaiming, sand conditioning, sand and mold handling system. National Engineering Co. offers a complete service for designing, building and installing sand systems to meet your requirements.

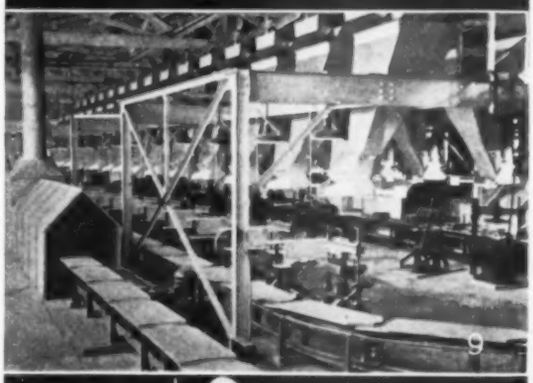
•

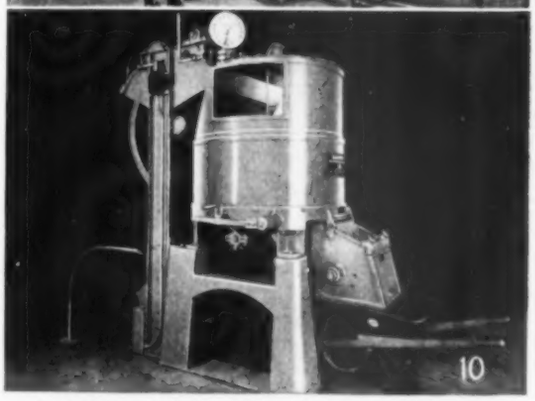
9. COOLING AND EXHAUST HOODS: Hoods of all types are available to meet individual requirements. If your sand systems give you "hot sand", a Simpson Cooling Hood will overcome that difficulty.

•

10. BUCKET LOADERS: One of the most useful auxiliaries to the Simpson Mixer is the Simpson Straight-Lift Bucket Loader, which consists of Reducer Drive, Solenoid Brake and Hatchway Limit Switches, and Start-Stop-Reverse Push Button Control. Loader may be designed to fit any installation.







Auxiliary Equipment Available with SIMPSON MIXERS

MACKLIN
GRINDING WHEELS

Macklin Wheels Are Uniform

Uniform grinding wheels must be subjected to sufficient heat to fuse the bond with the abrasive grains. Vitrified wheels undergo extreme heat in continuous and periodic kilns. Scientific and accurate equipment is used to record and regulate heat control to produce highest quality Vitrified wheels, while Resinoid, Silicate, Shellac and Rubber bonded wheels are cured at lower temperatures in electric ovens and are subjected to the same rigid control. Protect Your Production with Uniform Macklin Grinding Wheels.

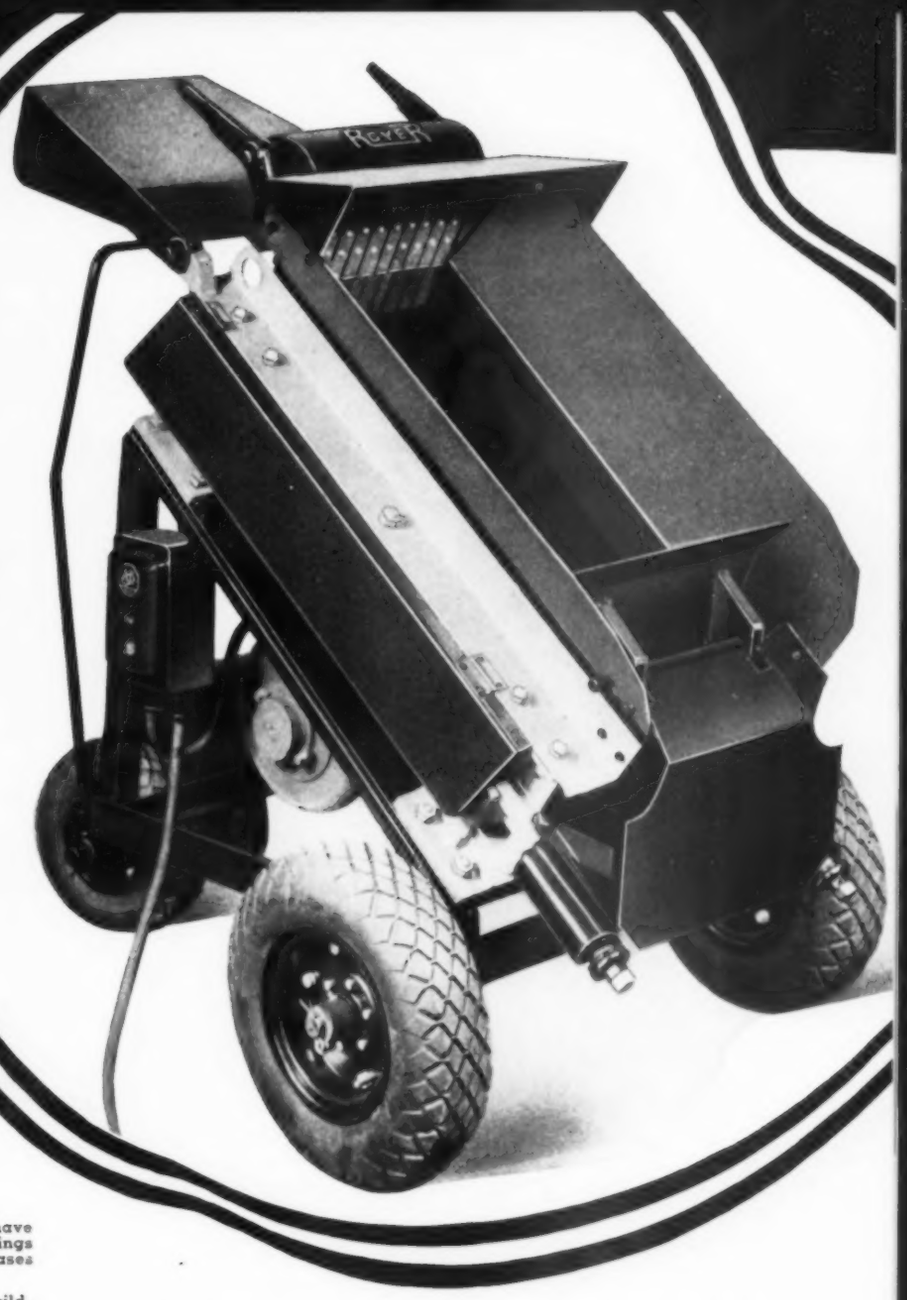
MACKLIN COMPANY

Manufacturers of GRINDING WHEELS — JACKSON, MICHIGAN, U. S. A.

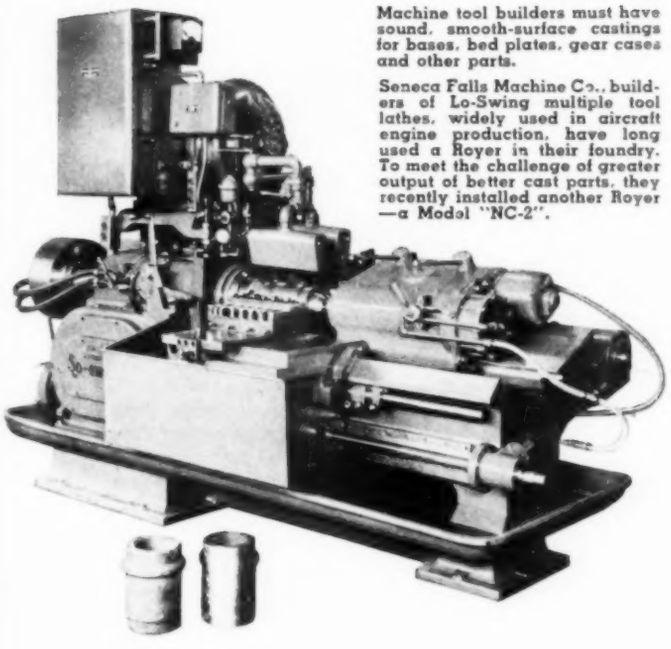
Distributors in all principal cities

Sales Offices: — Chicago - New York - Detroit - Pittsburgh - Cleveland - Cincinnati - Milwaukee - Philadelphia

Cut Casting Cleaning Time!



with *better molds* from Royer Conditioned Sand



Machine tool builders must have sound, smooth-surface castings for bases, bed plates, gear cases and other parts.

Seneca Falls Machine Co., builders of Lo-Swing multiple tool lathes, widely used in aircraft engine production, have long used a Royer in their foundry. To meet the challenge of greater output of better cast parts, they recently installed another Royer —a Model "NC-2".

Royer Sand Separators and Blenders give you velvety, airy sand that makes better true-to-pattern molds. You get smoother facings that eliminate scabs and roughness. It's a fact that Royers frequently eliminate the need for facing sand. Castings look better and take less time in the cleaning room.

Royers get the most out of your molding materials by providing thoroughly mixed, blended and aerated trash-free sand that responds to hand and mechanical floor and bench molding.

Low in height, easy to shovel into, they enable molders to turn out more molds per shift. They condition as fast as shovelers can feed them. They're a "priority equipment" for today's defense casting needs.

Six portable models for ferrous and nonferrous jobbing shops; crane-handled combination conditioners and scrap removers for large iron and steel jobbing shops; three stationary models for handling sand from mullers in production foundries. Keep ahead with Royers!

THE ROYER

ROYER FOUNDRY & MACHINE CO. KINGSTON, PA.

"THAT SAND CONVEYOR IS A *JINX!*" He told Me*

*THE REX MAN

. . . "IT'S ALWAYS NEEDING SOMETHING!"

① **AND IT ALWAYS** will be needing something, I told this worried foundry engineer—until you use idlers that will take the kind of punishment you give them without breaking down constantly. That means, of course, *Rex Idlers.*

② **"DO YOU REALLY** think that they can give better service than those idlers which I am now using?" he asked me. "After all, I don't think they cost any more; they certainly don't look much different. What have they got?"

③ **WELL, THEY ARE DIFFERENT!** Foundry men the country over, where quality and dependable service are the first requirements, will tell you that the difference lies in Rex's rugged reliability and long life. "Second to none," they say.

④ **THE SECRET IS** their design. With their precision, inner-tube-alignment bearings, triple sealed against dust or against oil leakage, they have eliminated a lot of the old worries due to rotting belts and early weave and wobble.

⑤ **AND REMEMBER THIS**—if it ever becomes necessary to replace a Rex idler roll—you buy the roll only. You don't have to buy a complete new unit, because rolls are interchangeable in the same frames. That saves hard cash, too!

⑥ **"WELL, THAT ALONE** is enough to make me consider Rex very seriously. We're having a lot of trouble with these because we must replace the entire unit. I'll check up and chances are you'll find an order from me before very long."

Rex idlers are seeing extensive service in busy foundries these days. The Rex man can help you apply them to your foundry production line to best advantage. Naturally, orders bearing highest priority distinction take precedence. Chain Belt Company, 1716 West Bruce Street, Milwaukee, Wisconsin.

REX CONVEYORS

CHAIN BELT COMPANY OF MILWAUKEE

Baldwin-Duckworth Chain Belt Division, Springfield, Massachusetts • Worcester, Massachusetts
Rex Chain Belt and Conveyor Divisions, Milwaukee, Wisconsin

REX CHAIN BELT COMPANY

How we can help you meet your *Ferro-Alloy Requirements*

"ELECTROMET" FERRO-ALLOYS AND METALS FOR THE CAST IRON FOUNDRY	
Added to the Cupola	***Result***
"EM" Silicon Briquets (round)	Deoxidize and aid machinability by graphitizing effect. Reduce chill in light sections. Permit easy control of silicon additions.
"EM" Chromium Briquets (hexagonal)	Increase hardness, wear resistance, corrosion resistance, and heat resistance. Promote greater density. Permit easy control of chromium additions.
"EM" Manganese Briquets (square)	Act as a scavenger. Harden iron when added in large quantities. Permit easy control of manganese additions.
Added to the Ladle	***Result***
85% Ferrosilicon 50% Ferrosilicon	Deoxidizes and aids machinability by graphitizing effect. Reduces chill in light sections. (85% grade used for large additions.)
Silicon-Zirconium	Deoxidizes and graphitizes, improving density of iron.
Ferromanganese-Silicon	Combines graphitizing influence of silicon with scavenging action of manganese.
Ferromanganese	Acts as scavenger. Hardens iron when added in large quantities.
Foundry Grade S.M. Ferrochrome	Increases hardness, wear resistance, corrosion resistance, and heat resistance. Promotes greater density.
Ferrovanadium	Refines grain (of value particularly in improving impact strength of hard irons).
"Electromet" Special Graphitizer	Maintains gray fractures of edges and in light sections. Deoxidizes and improves machinability. Reduces chill.
"SMZ" Alloy	Converts normally hard white iron into high-strength gray iron. Reduces chill. Improves strength and physical properties.
"CMSZ" Alloy	Improves wear resistance without sacrificing machinability. Reduces chill without sacrificing density. Improves density without increasing chill.

UNDER present conditions, perhaps you can't get all the ferro-alloys you want in the grades you are accustomed to using. If so, it may be necessary for you to modify your practice to use alloys that are available. You may be able to substitute available standard sizes and analyses for special grades. You may be able to use a different combination of deoxidizers to achieve the same result. Or perhaps you can change the composition of your iron to take advantage of alloys that are available, and still obtain equally good physical properties.

With the knowledge gained through 35 years' experience in the manufacture and use of ferro-alloys, we may be able to suggest what you can substitute and how you can change your practice to

get the results you want. Our metallurgists can give you practical, on-the-job help. Ask for this service to help meet your ferro-alloy requirements. No obligation is involved.

Electro Metallurgical Company
Unit of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York, N. Y.

"Electromet" Ferro-Alloys and Metals are available through offices of Electro Metallurgical Sales Corporation in Birmingham, Chicago, Cleveland, Detroit, New York, Pittsburgh, and San Francisco. In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario.

The word "Electromet" and the letters "EM," "CMSZ," and "SMZ" are registered trade-marks of Electro Metallurgical Company.

Electromet
Trade Mark
Ferro-Alloys & Metals

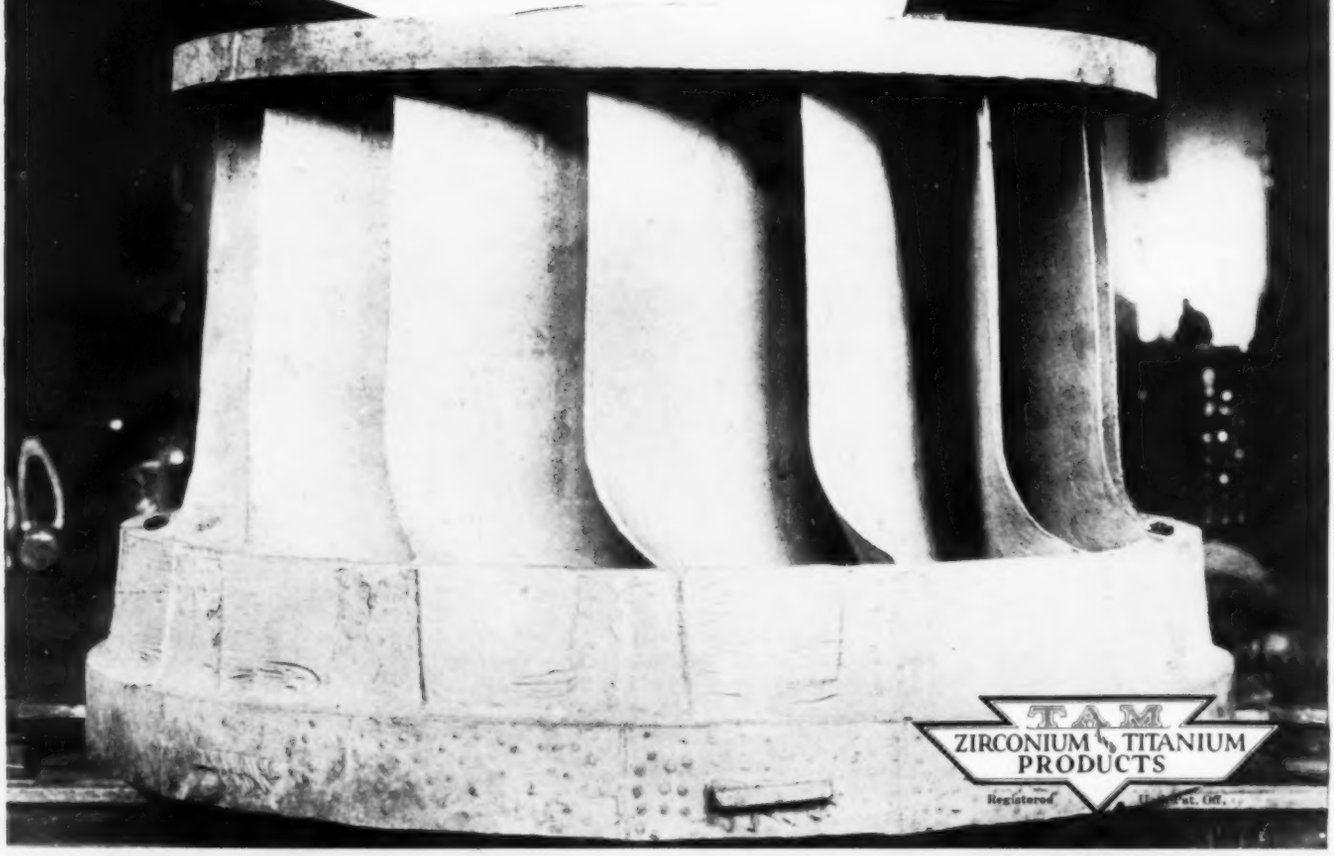
SMOOTH FACES FOR CASTINGS

TAM Zirconite super-refractory mold and core washes produce smoother surfaces and reduce cleaning costs

By resisting the burning-in of the molten metal, TAM Zirconite Mold and Core washes speed up output of good castings by reducing the number and time of cleaning and finishing operations. Available in three grades: Zirconite A has a melting point above 3775° F.; Zirconite B has a melting point above 3600° F.; and Zirconite C, for special uses, has a melting point above 3600° F. They are quickly mixed by adding to water, and can be applied by either spraying, swabbing or painting on cores and molds. Write for complete details, today.

TITANIUM ALLOY MANUFACTURING COMPANY

Zirconite Wash was used on this 94,000 pound .30-.35 carbon steel casting—11'6" high 14' diameter. Of special interest is the fact that no nails were used in the facing.

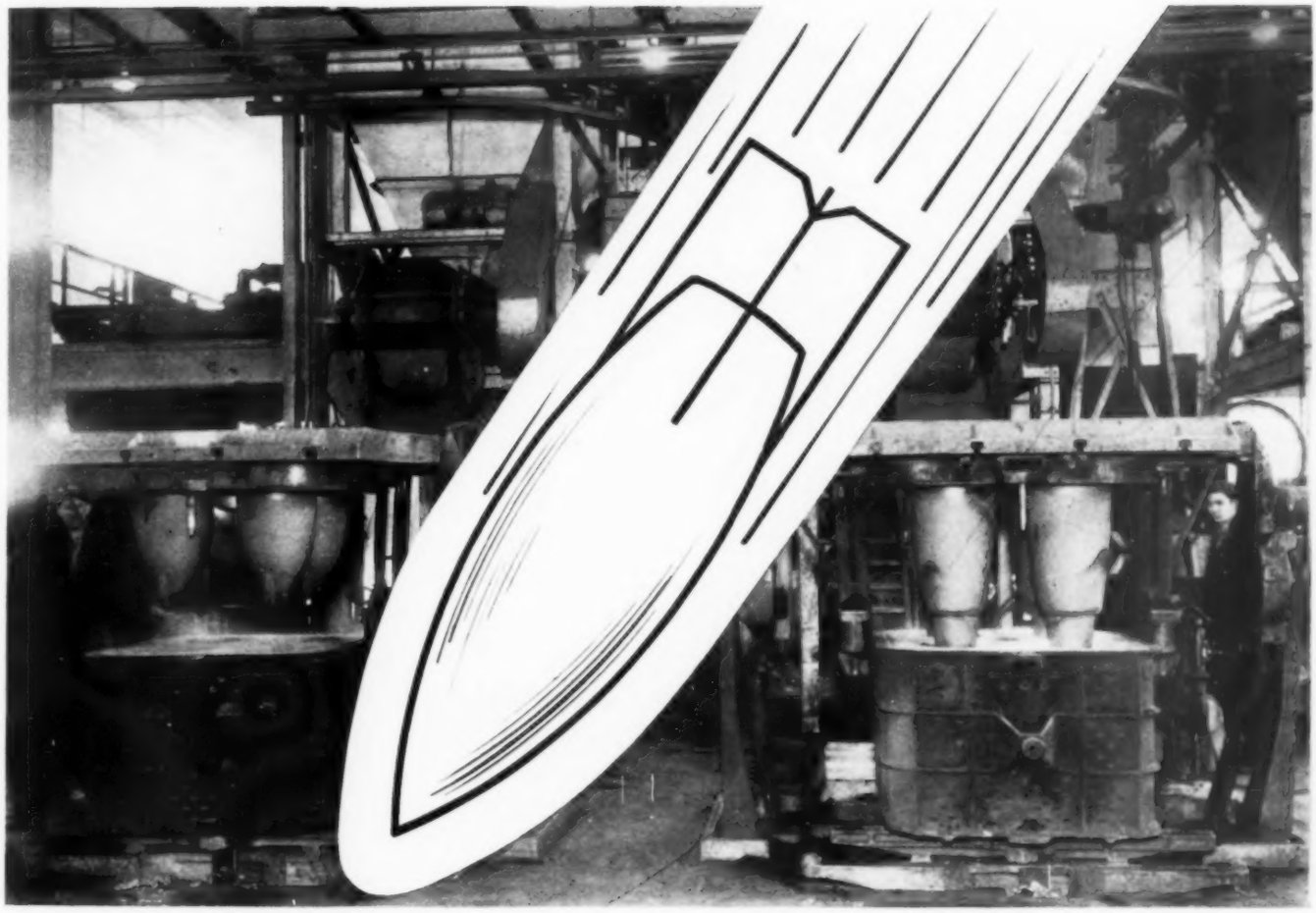


TAM ZIRCONIUM TITANIUM PRODUCTS

Registered U.S. Pat. Off.

GENERAL OFFICES AND WORKS: NIAGARA FALLS, N. Y., U. S. A.
EXECUTIVE OFFICES: 111 BROADWAY, NEW YORK CITY

Representatives for the Pacific Coast . . . BALFOUR, GUTHRIE & CO., San Francisco, Los Angeles, Portland, Seattle, Tacoma
Representatives for Canada . RAILWAY & POWER ENG. CORP., Ltd., Toronto, Montreal, Hamilton, Winnipeg, Vancouver, Sydney
Representatives for Europe . . . . . T. ROWLANDS & CO., Ltd., 23-27 Broomhall St., Sheffield, England



Canadian Foundry Achieves High Speed Bomb Production with HERMAN MOLDING MACHINES

Two Herman 6000 pound Series Jarr Roll-over and Pattern Drawing Machines are helping the Allies' effective War prosecution by rapid production of molds for 500 pound General Purpose High Explosive Bombs.

This foundry has taken full advantage of the many modern and exclusive features of Herman Molding Machines by co-ordinating them with other modern foundry practices. Herman Electric Timers automatically regulate the number of jarrs given each mold. The operator instantly clamps and unclamps the molds without leaving the operating valve. The basic construction of Hermans makes possible the deep draws necessary and the smooth, steady hydraulic action for both rollover and pattern draw assure the accurate draws so vital for good molds.

Now is when our 40 years' experience in the exclusive production of Molding Machines will pay dividends in your foundry. Our engineers will be glad to help you solve your mold production problems.

MOLDING HERMAN MACHINES

HERMAN PNEUMATIC MACHINE CO., UNION BANK BUILDING, PITTSBURGH, PA.

TIME IS ~~SHORT~~ *Priceless*...

Save It

To save time in obtaining x-ray inspection apparatus that you can rely on to help maintain the high quality so vital to the machines or munitions you make—we offer:

G-E X-RAY ENGINEERS. First to apply x-ray to industrial inspection—more than 20 years ago—their intimate knowledge of modern manufacturing processes equips them to give you reliable facts about the G-E X-Ray Unit best suited to your particular problem.

To save time in production—to speed manufacture of urgently needed equipment, we offer:

G-E INDUSTRIAL X-RAY UNITS. Unlike ordinary x-ray apparatus, G-E Industrial X-Ray Units are engineered to the job. They're designed and built to withstand the rigorous service expected of plant equipment; they'll take heavy duty cycles in their stride with day-in-and-day-out dependability.

To save time in the maintenance of high-speed production schedules, we offer:

G-E X-RAY SERVICE—provided by more than 35 direct factory branch offices. Staffed with factory-trained field engineers and servicemen, these strategically located offices are equipped to render fast, efficient service—another important G-E X-Ray time saver.

Today, when every minute counts for so much, you cannot afford to take chances with inspection facilities that may bog down production schedules. When you consider the many exclusive advantages of G-E Industrial X-Ray Units and G-E Service, you will readily see why the majority of important concerns employing x-ray have selected G-E X-Ray apparatus as ideal to meet their needs.

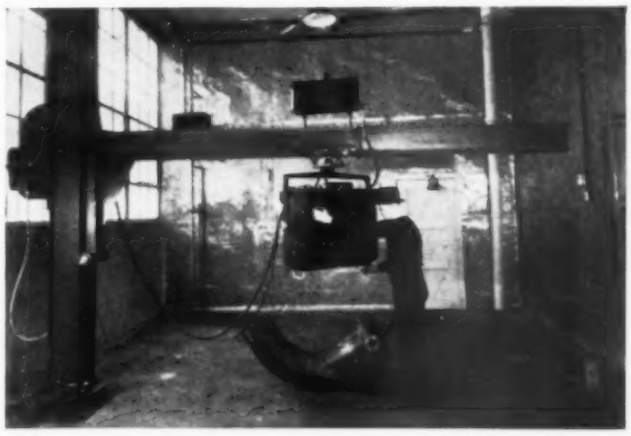
The best way to get complete information on G-E X-Ray Units is to call an experienced x-ray engineer to help you apply x-ray to your problem. You can rely on G-E engineers and equipment—both are backed by more than 45 years' experience in the design and manufacture of high quality x-ray apparatus.

To request the services of G-E Industrial X-Ray Engineers, write or wire, today; address Department R32. General Electric X-Ray Corporation, 2012 Jackson Boulevard, Chicago, Illinois.

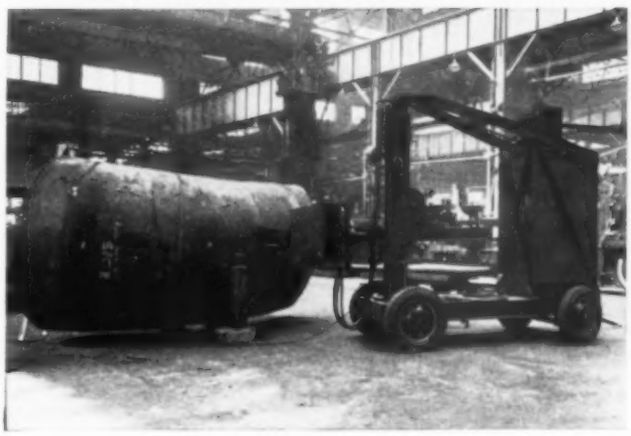
GENERAL ELECTRIC

Here's How G-E X-Ray Can Help You

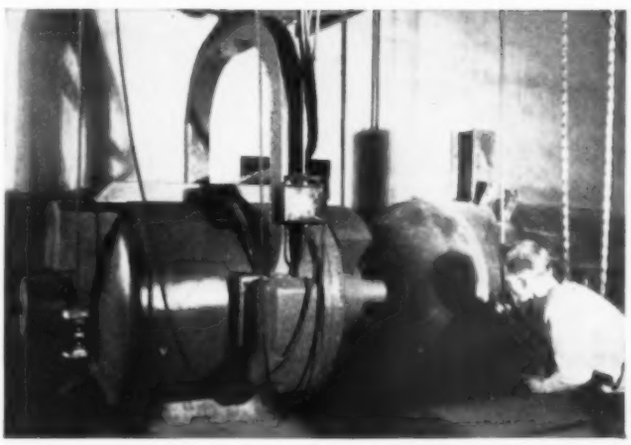
STANDARD UNIT DESIGNS provide the necessary variety of mountings for the full voltage range of G-E shockproof and climate-proof Industrial X-Ray Units. Available in four basic types. Shown here: Stationary Jib Crane with motor-operated jib travel (also built for manual operation). Others: Mobile Units mounted on pneumatic tires or rails; Mobile Jib Crane mounted on rubber-tired chassis with motor-operated jib travel; Overhead Bridge Crane with motor-operated vertical travel.



FULL FLEXIBILITY is built into every G-E X-Ray Unit to save valuable operating time and to make easy accurate positioning for practically all types of radiography. Simplicity of operation is assured because all electrical controls are centered in one compact panel, and every facility for exact duplication of results is provided. Control for this mobile unit is housed in the lead-lined operator's cab.



A COMPLETE LINE of Industrial X-Ray Units—with a full range of power up to and including one-million volts, in a wide variety of types to meet every requirement. Shown at right is the G-E 1000 Kv unit being positioned prior to taking a 360° circumferential weld radiograph. This compact unit is a full answer to imperative defense demands for an accurate, high-speed method of inspecting large castings, weldments, and pressure vessels.



X-RAY CORPORATION

Have War Conditions Changed the Class of Castings Made in Your Foundry?

SELECT FROM THE WORLD'S LARGEST VARIETY OF MOLDING SANDS THE KIND YOU NEED TO MEET YOUR CONDITIONS

Some Famous Grades that are used from Coast to Coast:

SS **No. 3 Molding Gravel** **AP-5** High sintering, very permeable sands for Machine Tool, Diesel Engine and other heavy green and dry sand molding.	**Gold Seal** **RM-21, Comet SM** **PRS, 4-M** Popular for light to heavy brass and bronze, aircraft castings and many classes of light to medium ferrous castings.	**C-1, C-2** **Gold Seal No. 4** **5-R** Extra refractory sands ideal for malleable, electric furnace alloy irons, high strength and special alloy ferrous and non-ferrous metals.

(*These are only a few of our many grades*)

LET US HELP SPEED PRODUCTION, SPEED CLEANING AND FINISHING OPERATIONS . . . DECREASE YOUR LOSSES BY PROPER SELECTION OF QUALITY SANDS, PROPERLY PRODUCED

• • • ▬

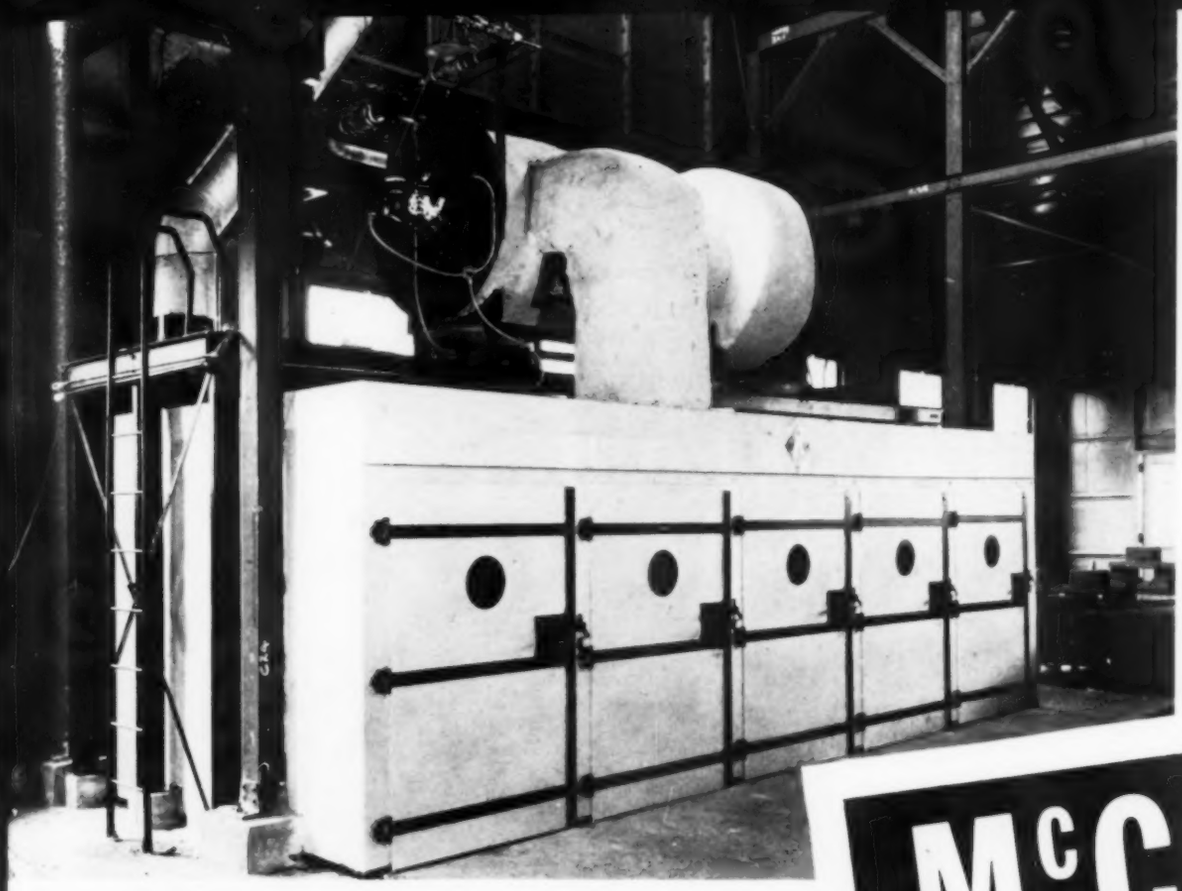
Each Car individually tested to insure uniformity. More than 5000 tests were made in five H&H Laboratories during 1941

1910 — 1942

HOUGLAND & HARDY, Inc. • HARDY SAND COMPANY

PRODUCING THE WORLD'S LARGEST VARIETY OF MOLDING SANDS

Evansville, Indiana



THIS BATCH TYPE

CORE OVEN

is baking cores perfectly in 1/3 to 1/2 the time formerly required.

•

MAXIMUM CAPACITY PER UNIT OF FLOOR SPACE

•

UNIFORM BAKING

(Regardless of position of cores in the oven.)

•

LOW FUEL CONSUMPTION

McCANN

OVENS AND FURNACES

Do Their Part

THIS

FURNACE

is used for

STRESS RELIEVING

ANNEALING

AND NORMALIZING

Steel and Gray Iron Castings

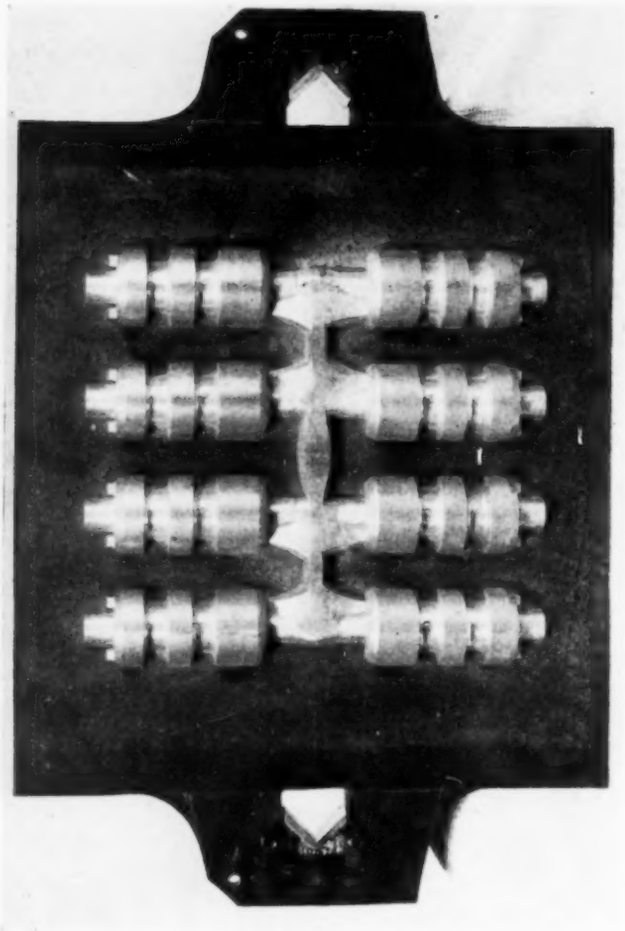
5003 EUCLID AVE.
CLEVELAND, OHIO

McCann Furnace Company
INDUSTRIAL FURNACE & HEATING EQUIPMENT

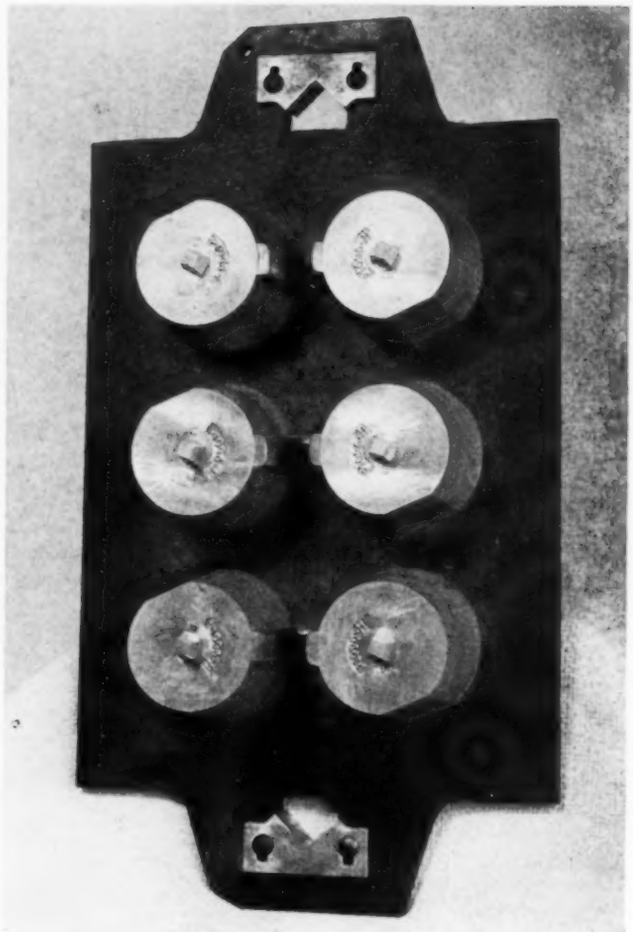
Batch and Continuous Type Core Ovens—Heat Treating and Annealing Furnaces
Complete Recirculating Heating Systems for Existing Ovens

For Your Job

Use LIGNOLITE Pattern Plates



Match Plate mounted on 14" x 16" **LIGNOLITE** plate by prominent Midwestern manufacturer.



11" x 16" **LIGNOLITE**-mounted flat back plate with only gate in cope—from same user.

● LIGNOLITE is a reliable, proven material that meets the exacting requirements of pattern and match plate use. It is a laminated lignin plastic which looks like metal, feels like metal and acts like metal! Low in cost and extremely *light in weight*, it is *water-resistant* and will not warp, crack or swell. LIGNOLITE has a dense, uniform structure and can satisfactorily be used with vibrators. It *machines easily* and can be readily milled, sawed, tapped, etc.

Don't take our word for it! Try a plate on your own work and see for yourself. Drop us a line today, asking that we send you complete descriptive details, sample and prices.

HOW TO ORDER: Order by flask size and specify thickness. Available for any sized flask in thicknesses from ¾" to 1½" in ⅛" steps. Also supplied in 46" x 46" boards if you wish to cut your own plates.
IMMEDIATE DELIVERY: Your requirements can be filled without limitation or delay.

MARATHON CHEMICAL COMPANY

DIVISION OF MARATHON PAPER MILLS COMPANY

ROTHSCHILD **WISCONSIN**

Schundler

FOUNDRY BENTONITE

24-HOUR SERVICE
TO MOST FOUNDRY CENTERS

◆

Akron, Ohio.....H. S. Staller
Birmingham, Ala.....Foundry Service Co.
Boston, Mass.....Klein Farris Co., Inc.
Chattanooga, Tenn.....Frank Robbins Jr.
Chicago, Ill.....E. J. Steelman
Chicago, Ill.....Wobens Abrasive Co.
Cleveland, Ohio.....Dahl Foundry Sand Co.
Coldwater, Mich.....The Foundries Materials Co.
Dallas, Texas.....Beredo & Page, Inc.
Edwardsville, Ill.....Midwest Foundry Supply Co.
Houston, Texas.....Beredo & Page, Inc.
Kansas City, Mo.....Beredo & Page, Inc.
Long Island City, N. Y.....F. E. Schundler & Co., Inc.
Los Angeles, Cal.....Independent Fdy. Supply Co.
Milwaukee, Wis.....Thomas H. Gregg
Minneapolis, Minn.....E. R. Frost Co., Inc.
Moline, Ill.....Midwest Foundry Supply Co.
New Orleans, La.....Beredo & Page, Inc.
Oklahoma City, Okla.....Beredo & Page, Inc.
Philadelphia, Pa.....Penn. Fdy. Supply & Sand Co.
Portland, Ore.....Miller & Zahrung Chemical Co.
St. Louis, Mo.....Midwest Foundry Supply Co.
San Francisco, Cal.....Industrial Supply Co.
Seattle, Wash.....Carl F. Miller & Co.
Toronto, Canada.....Meir Foundry Supply Co.
Tulsa, Okla.....Beredo & Page Supply Co.
Wichita, Kans.....Beredo & Page Supply Co.

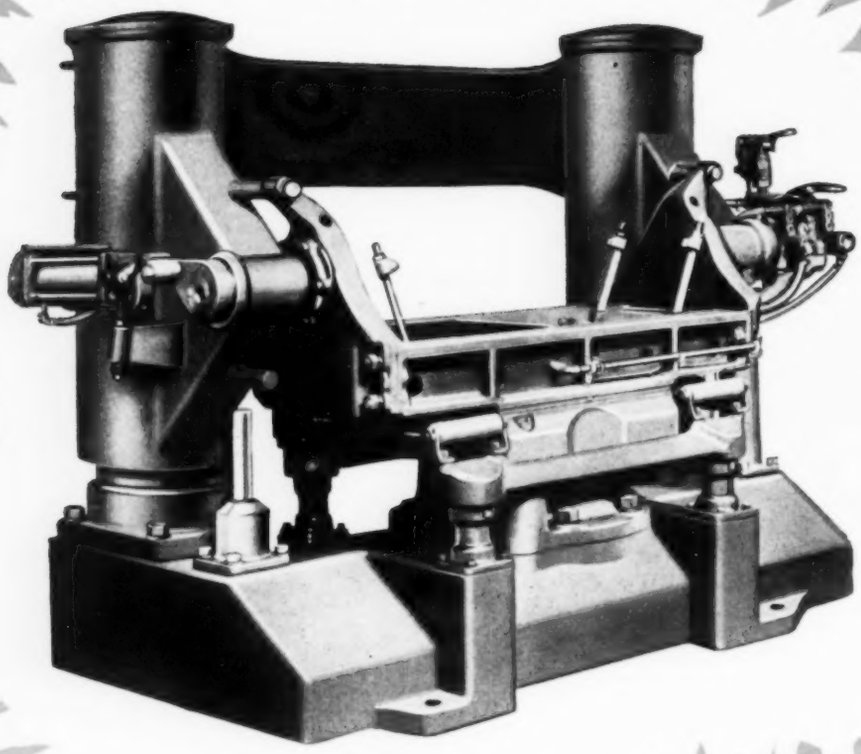
READY FOR SERVICE IN OUR NATIONAL DEFENSE PROGRAM

● Our ability to keep pace with your "PRODUCTION FOR VICTORY" schedules is now better than ever. With mill capacity doubled and recently acquired holdings added to our already substantial holdings we say to you again—NO MATTER WHAT HAPPENS—in the rush and speedup of the present days and those ahead—SCHUNDLER FOUNDRY BENTONITE will be available in any quantity you will ever need.

Authorized to license foundries under Hanley Patent 1657573

A DEPENDABLE PRODUCT SOLD WITH COMPLETE TECHNICAL SERVICE

3 Versatile Machines



Equipped with

Adjustable Air Clamps
Power Rollover
Hydraulic Levelling
Rollout Conveyor

With or Without Jolt

When jolt is furnished, cradle is mounted on short guides and machine can be furnished two ways: (1) Entire machine above the floor line as shown. (2) No part above rollover cradle but cylinders below floor line.

POWER JOLT ROLLOVER DRAW

Here's a trunnion-type rollover machine that operates with a minimum of power. It has rollover cylinders separate from the cradle, requiring an absolute minimum of mechanism for rolling over.

The jolt is performed on a heavy base insuring a maximum packing blow. The draw is well guided on two large diameter pistons connected by a rigid member. Accuracy is maintained regardless of wear because the load on the pistons is off center. This type of machine is available in capacities up to 12,000 lbs.

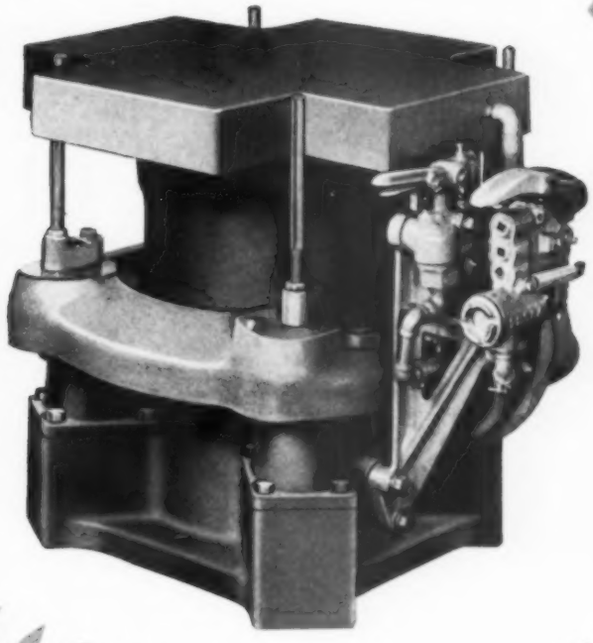
MILWAUKEE

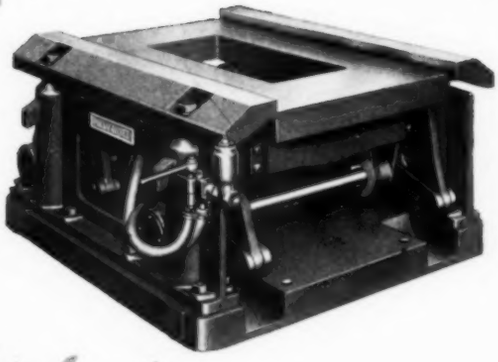
MANUFACTURERS OF MOLDING MACHINES AND BRIQUETTING PRESSES

THAT MEET TODAY'S FOUNDRY NEEDS

JOLT PIN LIFT

This machine is extremely simple in design to eliminate maintenance. The lifting frame consists of a rigid, integral member actuated by four equally spaced pistons. Lifting piston rods are hardened and ground and operate in hardened and ground bushings to guide the draw. Hydraulic power on lifting frame insures smooth performance. The slow draw valve is adjustable for speed and length of draw. Made in capacities up to 12,000 lbs.



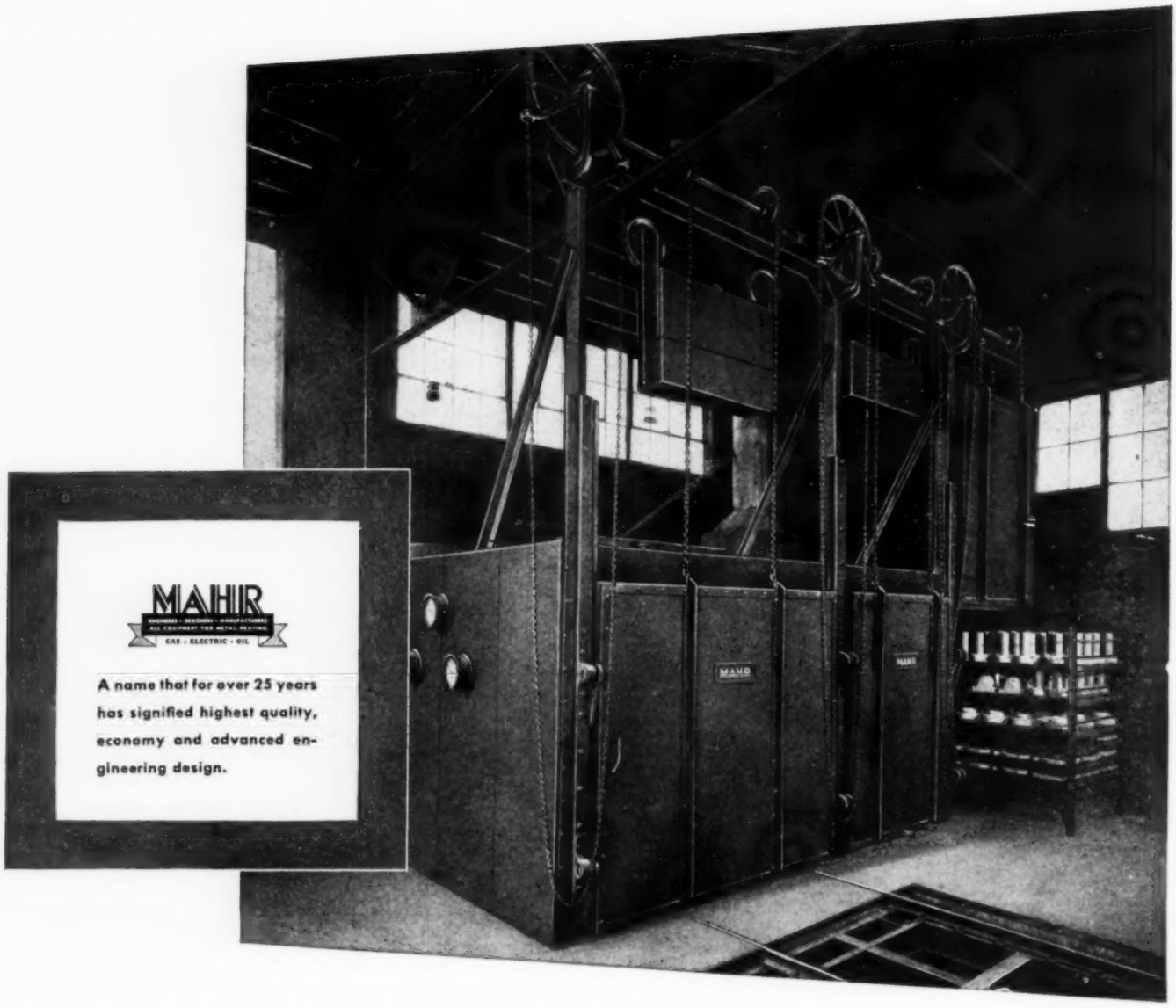


POWER DRAW

This type of Milwaukee Molder has seen hard service for over ten years with practically no maintenance. Each lifting rail is guided by two hardened and ground pins. The rails are connected through steel links and cranks which have hardened pins and bushings insuring parallel motion for pattern draw. Made in capacities up to 12,000 lbs.

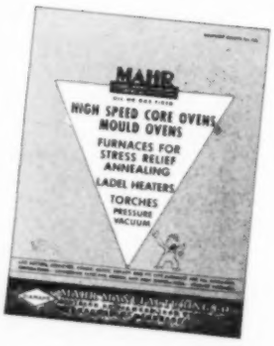
Foundry Equipment Co.

3238 WEST PIERCE STREET · MILWAUKEE, WISCONSIN, U. S. A.


MAHR
GAS - ELECTRIC - OIL
A name that for over 25 years has signified highest quality, economy and advanced engineering design.
MAHR

ASK FOR YOUR COPY OF THIS new BOOK

At the very foundations of our victory program stand the foundries of America. From them must flow, rapidly and continuously, the millions of castings needed for the tools of this war . . . Just off the press, this new MAHR Bulletin No. 750 tells the intimate and complete story of the ovens, furnaces, ladle dryers, torches etc. that play such an important part in the production of any good foundry. *Ask for it today!*



MAHR is making exceptionally prompt deliveries under unusual conditions. Ask about them.

DIAMAHR

MAHR MANUFACTURING CO.
DIVISION OF DIAMOND IRON WORKS, INC.
MINNEAPOLIS, MINNESOTA, U. S. A.

RED STREAK FLANGES

Pat. 2,121,656

FOR FOUNDRY SNAGGING

. . . a patented feature exclusive with Abrasive Company high speed resinoid bonded snagging wheels with 6, 10 and 12-inch hole sizes . . . for use on swing frame and floor stand grinders.

Outstanding features include easier mounting, a better spindle fit and an additional safety factor . . . *at no extra cost!*

Supplied in grain and grades that give fast cutting action consistent with long wheel life. Write for details!

Billet Grinding	
High Carbon and High Speed Steel	14 -PB -B5
Stainless and Alloy Steel	14 -RB -H3 H14 -UB -A3
Cast Iron	B146 -OB -B7
Steel Castings	
Floor Stand	14 -OB -K5
Swing Frame	12 -PB -E5

ABRASIVE COMPANY GRINDING WHEELS

. . . are basic tools for War Production. Their efficient cutting action on a myriad of grinding applications is essential for the manufacture of vital war materiel. For example, castings, plates and parts for tanks, guns, ships and airplanes are first rough ground in foundries and steel mills. "ABRASIVE" Wheels are proving their worth on these important grinding jobs. Chances are you can benefit from their use on your foundry snagging work—on swing frame, floor stand and portable grinders.

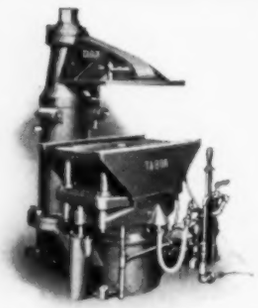
Help us to help you—by providing the highest available priority ratings on your grinding wheel purchase orders.

1892—*Fifty Years of Service to Industry*—1942

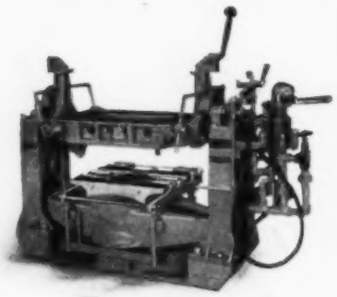
ABRASIVE COMPANY

DIVISION OF SIMONDS SAW AND STEEL CO.

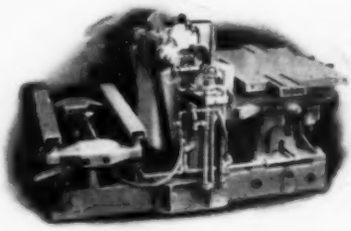
TACONY & FRALEY STS., PHILADELPHIA, PA. • DISTRIBUTORS IN ALL PRINCIPAL CITIES



Jar Squeeze Flask-Lift Machine
(Pintle Post)



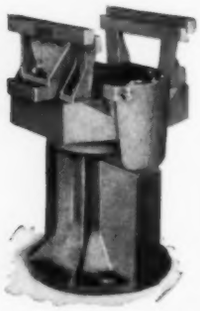
Trunnion Jar Rollover Pattern
Draw Machine



Jar Ram Power Rollover Power Draw Machine. Table slots provide for use of air-operated flask clamps.

TABOR
TRADE 1885 MARK

FOUNDRY MOLDING MACHINES



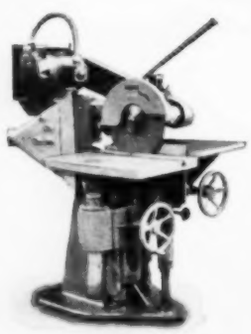
Jar Flask-Lift Machine

Column Jar Squeezer

Plain Jarring Machine

Tabor Foundry Molding Machines are not new to foundrymen. We have been designing, building and adding to the line for over half a century, to keep pace with changing foundry practice. That is why we are able to say again today without fear of successful contradiction:—"Tabor offers the right type of machine for any molding need".

SQUEEZERS • JAR SQUEEZERS • HINGED ROLLOVER MACHINES • TRUNNION ROLLOVER MACHINES • JAR FLASK-LIFT MACHINES • JAR SQUEEZE FLASK-LIFT MACHINES • PLAIN-JAR AND SHOCKLESS-JAR MACHINES



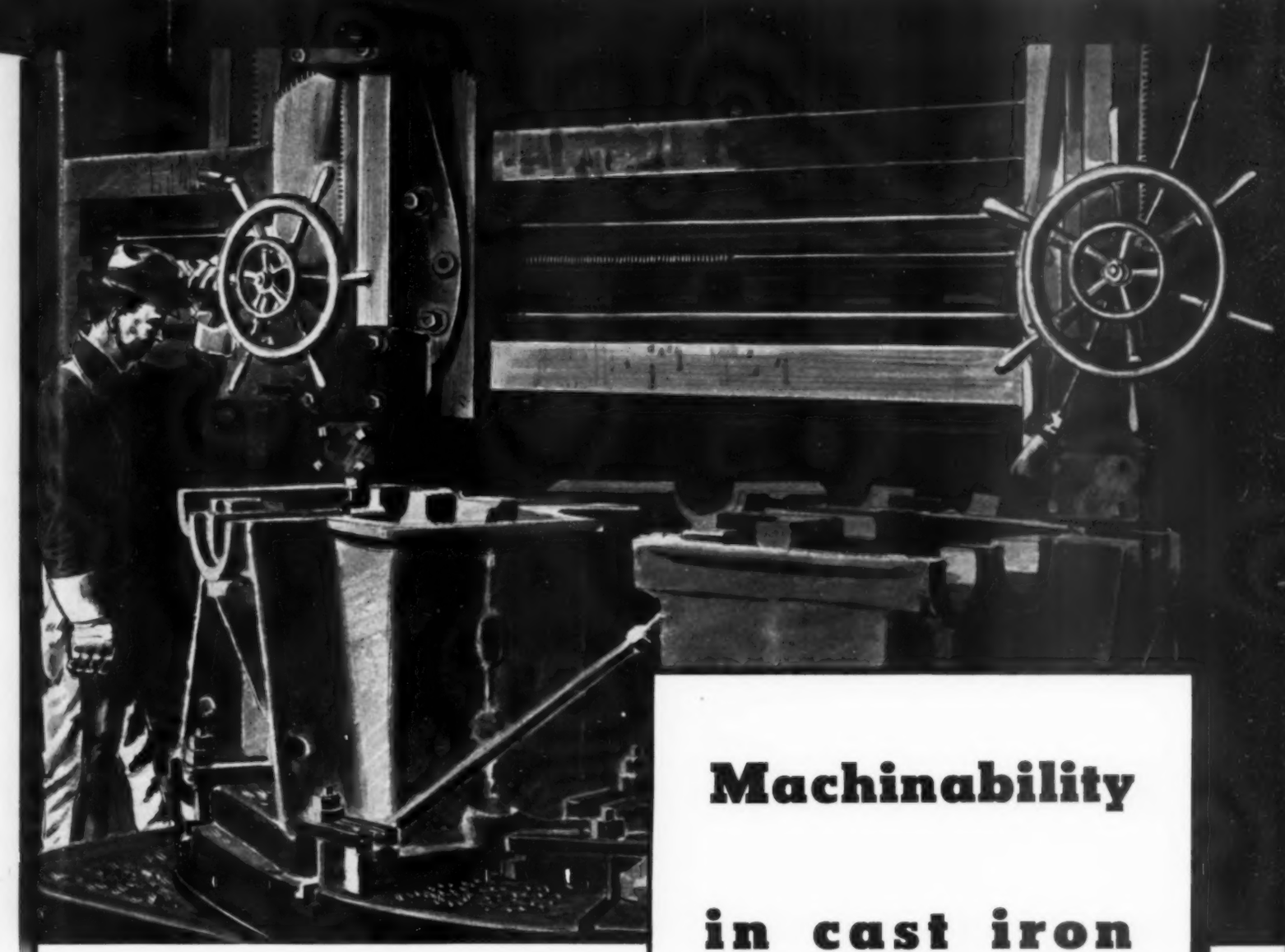
. . . and TABOR-BRASIVE CUT-OFF MACHINES

Save money, time and labor in cutting gates and risers from castings of manganese bronze, aluminum bronze, nickel, monel and other non-ferrous alloys, as well as alloy steel. Built in a complete line of sizes and types to meet any cutting need.

Write us regarding your foundry machine requirements.

THE TABOR MANUFACTURING COMPANY
6225 Tacony Street • Philadelphia • Pennsylvania

Representatives: *Los Angeles, Calif.*, Snyder Foundry and Supply Co.; *Oakland, Calif.*, Pacific Graphite Co.; *Seattle, Wash.*, Carl F. Miller & Co.



Machinability in cast iron

**"Arms of the best quality—and plenty of them.
Step up the speed—to the maximum.
But remember the tools. The tools are priceless.
Make the most of them."**

For higher cutting speed plus longer tool life, improve your machinability. But how do you improve machinability in cast iron?

It's mostly a matter of structure — uniformity of structure and elimination of hard edges. For example, a casting of 179 Brinell may have edges of 500 Brinell due to chilling. Another casting from the same pattern may have an overall hardness of 217 and machine much easier.

Then again, the trouble may be internal spots of ferrite or even massive carbides which hamper machining.

V-5 and V-7 Alloys reduce and stabilize chill depth and, by eliminating chilled edges, improve machinability. V-Alloys also promote uniformity of structure — pearlitic throughout — excellent for machining.

Result — either maximum rate of metal removal, or maximum tool life for the selected depth and speed of cut.

VANADIUM

ORPORATION OF AMERICA · NEW YORK, N. Y.

FERRO-ALLOYS

Important Announcement

FOUNDRY AND ALLIED INDUSTRIES SHOW

• At meeting of the Executive Committee of the Board of Directors, American Foundrymen's Association, January 11, it was voted to eliminate the Saturday "Preview Day" for exhibits, suspending a custom established when industry generally was working on a five-day week. With this change the dates for the

46TH ANNUAL CONVENTION

FIRST WESTERN HEMISPHERE FOUNDRY CONGRESS

ORDNANCE AND DEFENSE EXHIBITS

FOUNDRY AND ALLIED INDUSTRIES SHOW

are

MONDAY, APRIL 20, THROUGH FRIDAY, APRIL 24, 1942
CLEVELAND, OHIO

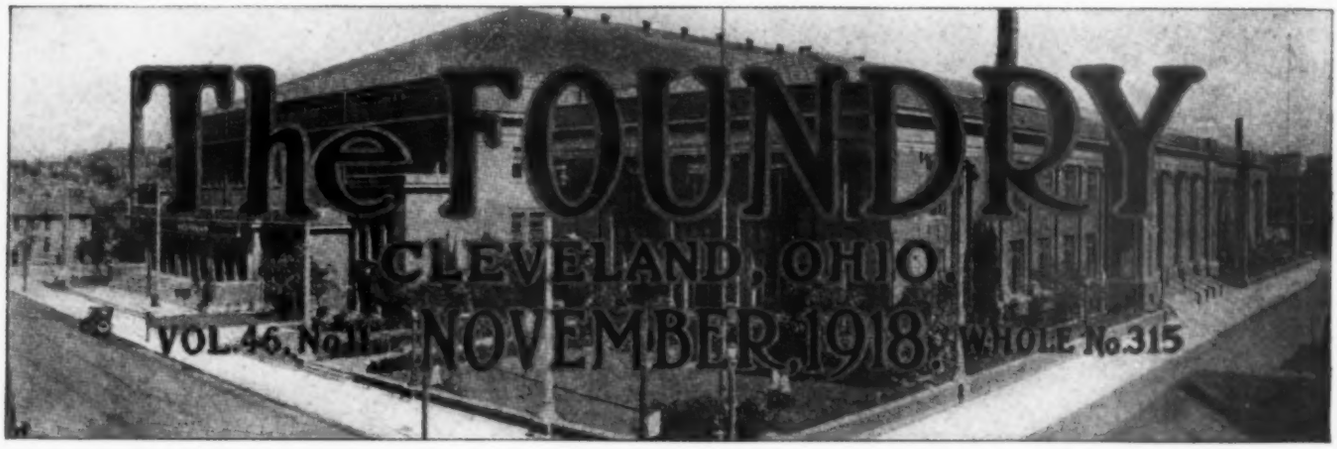
•

For information about Exhibit Space in this Show, address Department of Exhibits, American Foundrymen's Association, 222 West Adams St., Chicago, Ill.

Read reprint from November, 1918 issue of THE FOUNDRY on opposite page. Substitute the name of President Roosevelt for Wilson; Cleveland for Milwaukee; April 20 for October 7; 1942 for 1918, and you will have for all practical purposes the lead-off page for reporting the next

WIN-THE-WAR FOUNDRY CONVENTION AND SHOW

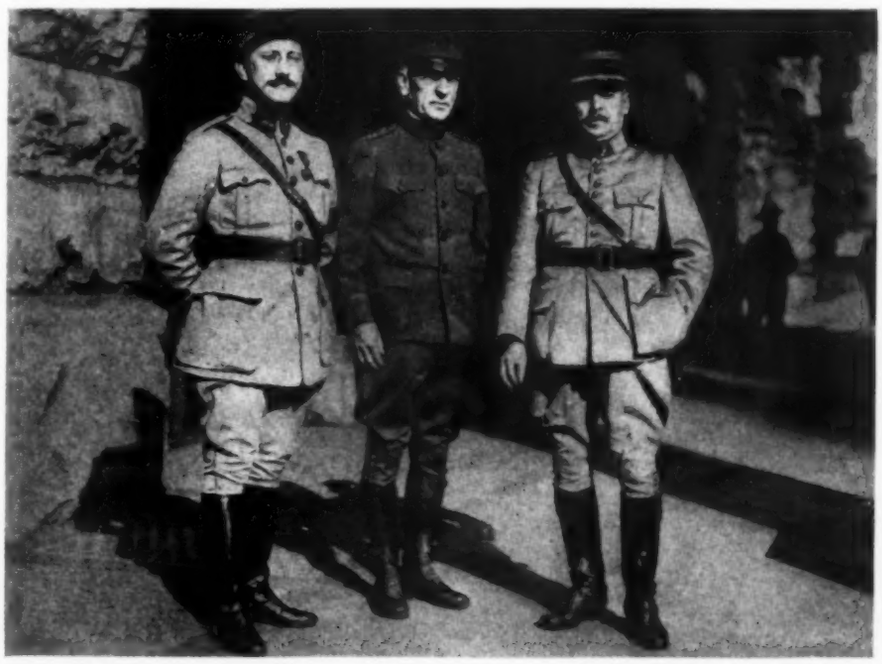
...V



Foundrymen Stage Big Win-the-War Convention

Patriotic Work of Tangible Value Accomplished at Big Allied Metals Congress in Milwaukee—Semisteel Shell Manufacture Discussed

FROM the stirring resolution telegraphed to President Wilson on Tuesday morning, through the annual banquet Thursday evening with its splendid patriotic addresses to the concluding session Friday morning, the great convention held in Milwaukee during the week of Oct. 7 under the auspices of the American Foundrymen's association, the American Institute of Mining Engineers and the American Malleable Castings association displayed a singleness of purpose and consistency of action fully in harmony with the grave necessities of the days through which the United States and its allies are now passing. In everyone's mind at Milwaukee was this one question—"How can we contribute more effectively to the winning of the war and to the abject and crushing defeat of German plans for world-wide tyranny?" Unofficially, but nevertheless aptly named the Allied Metals Congress, the Milwaukee foundry convention will go down in history as the unconditional surrender meeting of 1918. The win-the-war spirit was evident at every session, and reflected in every exhibit on the two floors of the great Milwaukee auditorium. This spirit found its most telling expression early in the week in the resolution already referred to. This resolution was adopted jointly through a unanimous rising vote by the American Foundrymen's association, the American Institute of Mining Engineers and the American Malleable Castings association. The complete text of the resolution is published on the following page. It pledges every resource of the allied metal trades to the government, not only for the production of materials for the conduct of the war, but for the accelerated manufacture of such materials in order to enable the government to bring about a speedy and crushing defeat of the enemy which will result finally in his abject and unconditional surrender. Tangible impetus was given this splendid resolution at every session throughout the week, and particularly at the great semisteel shell meeting on Thursday afternoon. This meeting was added to the regular program after the convention started at the request of the ordnance department in order to acquaint foundrymen with some of the details of the government's far-reaching plans for the



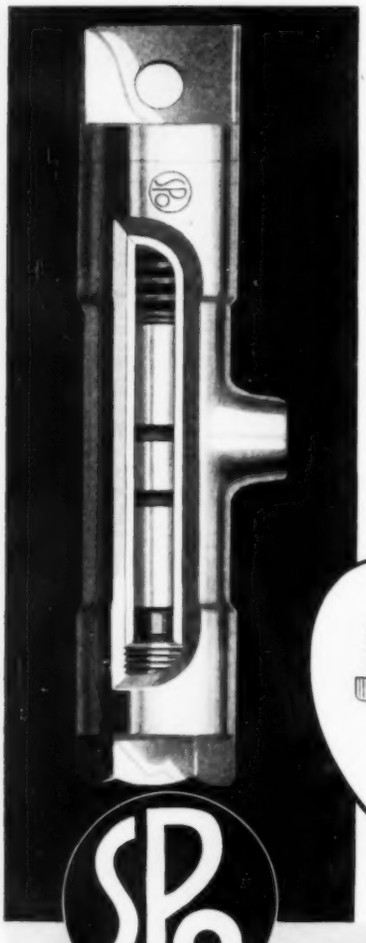
THE PRESENCE OF DISTINGUISHED FRENCH OFFICERS GAVE INTERNATIONAL COLOR TO THE CONVENTION

From left to right—Lieutenant Laurent of the French Technical Mission; Capt. O. C. Hall of the United States Army Ordnance Department; Capt. Guillemin of the French Technical Mission, in charge of the French Officers assigned to the Milwaukee convention.

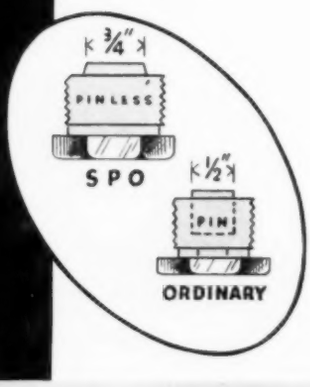
SAVE MAN HOURS

USE *New* SPO VIBRATORS

Today's new record is no good tomorrow! To beat it, *save man hours!* Don't allow maintenance to slow production unnecessarily. It doesn't pay, from any viewpoint, to repair old vibrators. This country is in a big hurry!



The SPO vibrator has a body of heat-treated high carbon forged alloy steel. The bushing or liner is made of special bronze broached and burnished. The plunger, of special alloy, is ground to a mirror-like finish. The resultant close tolerances permit virtually perfect fitting and operation. The one-piece pinless anvil averages 2¼ times as much striking area as on ordinary vibrators (see diagram). You have a carefully balanced unit that hits equally hard on both ends.



This country has never been in as great a hurry as it is now. Every man hour in every foundry must be conserved *for production.*

Worn vibrators crimp production. They can cause your disgusted molders to lose as many as 10 molds a day. Repairing vibrators takes probably a tenth of a good maintenance man's time, or at least a dollar a day. You need these man hours for duties more closely related to output. And the money you save would buy you a lot of *new* vibrators, which would keep more molders busy and give you better performance than patched-up, none-too-reliable vibrators can possibly yield.

SPO vibrators were designed "from the ground up"—as our long foundry experience taught us they should be. We have improved them whenever we could—and will so continue . . .

Have plenty of *new* SPO vibrators on hand. Save those man hours. Top today's production record tomorrow. We've got to!

SPO

INCORPORATED

Manufacturers and Specialists in Molding Machines, Vibrators, and Patterns for Production

East 61st Street and Waterman Avenue • • Cleveland, Ohio

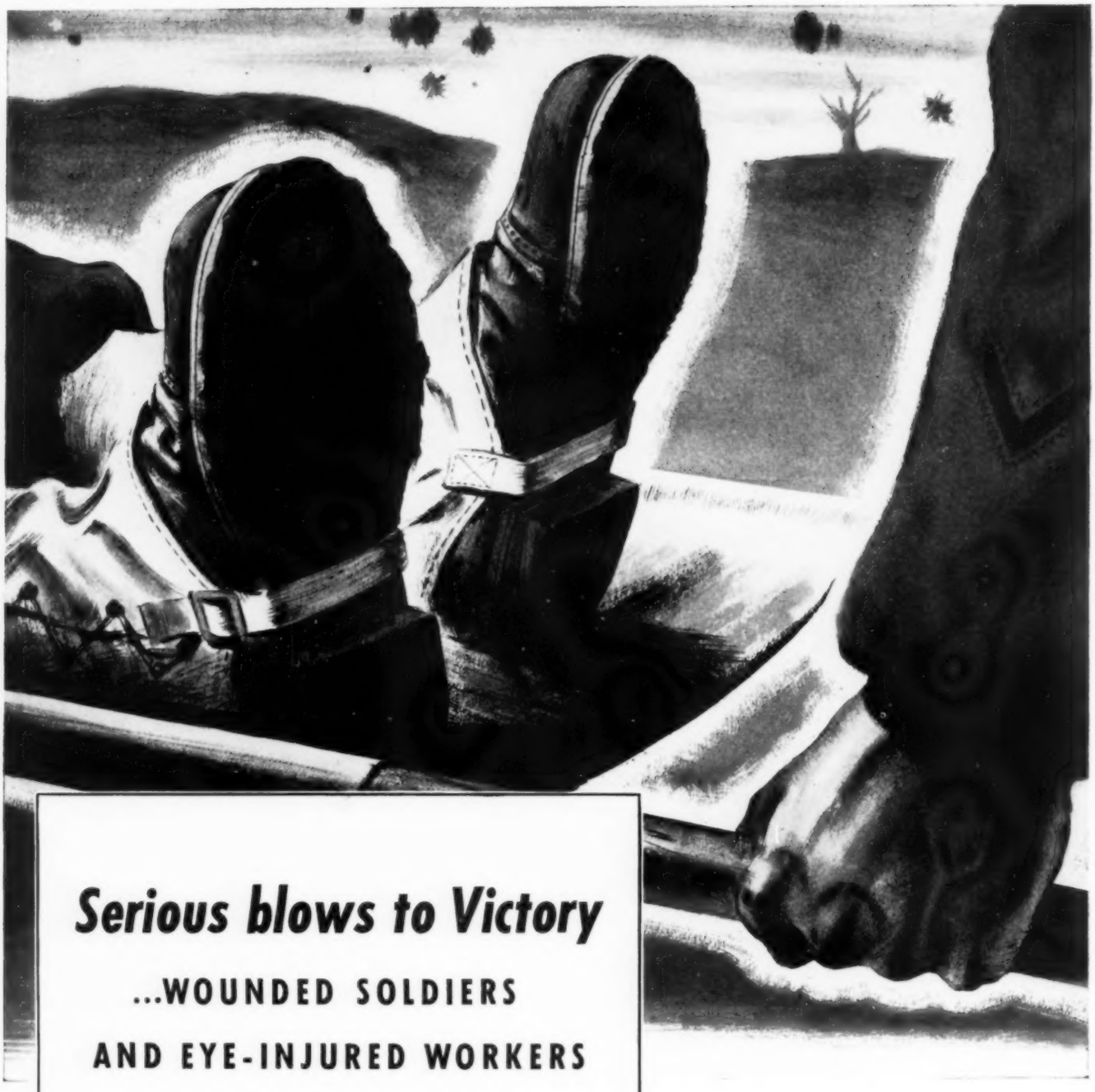
BUILT TO RESIST!

EWING GALLOWAY PHOTO

Mexico's famous tourist attraction—the Pyramid of the Sun located at Teotihuacan, is constructed of simple architectural design and minus all ornate projections that would tend to cause premature decay or wear—its broad slopes weathering the elements over the ages . . . "Weathering" the elements of the cutting and dissolving action of metals and their slags is Mexaloy's performance as a refractory mixture when used in the linings of ladles, runners, spouts and cupolas in the foundry: Slags and metals do not stick to a Mexaloy surface and skulls come away quickly and cleanly. Actually less expensive than ordinary loam coverings, Mexaloy proves an indispensable item for foundry use.

THE UNITED STATES GRAPHITE CO.
SAGINAW MICH.

MEXALOY



Serious blows to Victory

...WOUNDED SOLDIERS AND EYE-INJURED WORKERS

INDUSTRIAL eye-casualties that take workers—even temporarily—from the battle for the production of war materials, can hurt the cause of Victory as much—*or even more*—than the loss of a soldier or sailor. In 1940 and 1941, nearly 20,000,000 man-hours needed to turn out munitions, ships, tanks and planes were lost by *industrial eye accidents* alone.

Those lost man-hours were lost *forever*. A most terrible tragedy and waste. But the point right now is this: *eye accidents must not happen from now on.* GOGGLES MUST BE WORN. American Optical Company is working day and night to make available to plants throughout the country its line of light, comfortable, safe goggles . . . goggles equipped with Deep-Curved Super Armorplate Lenses for greater resistance to impact.

An American Safety Representative is located in an AO Branch Office near you. Please don't wait . . . call him in for his recommendations today.

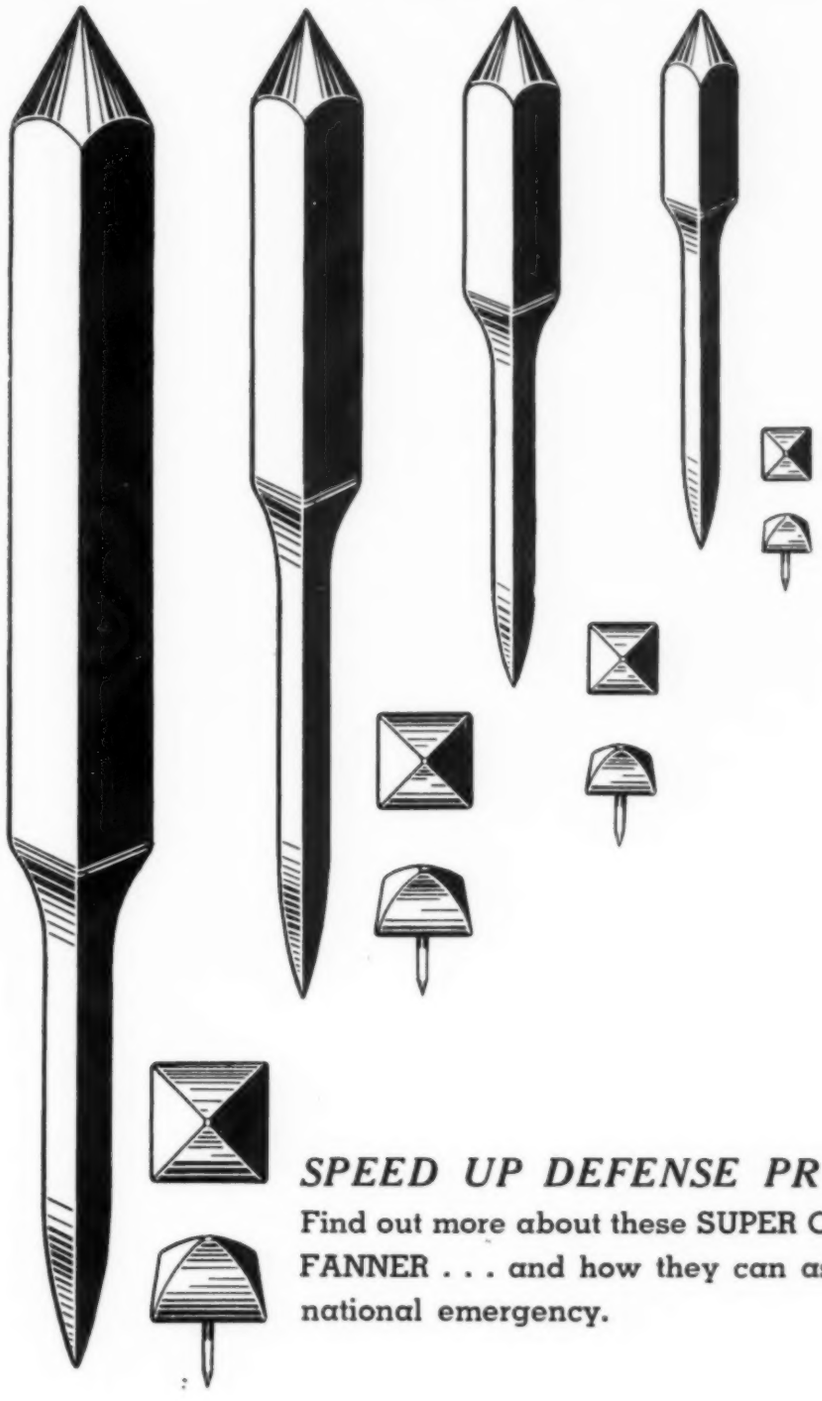
American Optical Company

Factories Located at Southbridge, Mass.

MANUFACTURERS, FOR MORE THAN 100 YEARS, OF PRODUCTS TO AID AND PROTECT VISION

SUPER CHILLS

PATENTED



SPEED UP DEFENSE PRODUCTION

Find out more about these SUPER CHILLS made by FANNER . . . and how they can assist you in this national emergency.

THE FANNER MANUFACTURING CO.

BROOKSIDE PARK **CLEVELAND, OHIO**

Let's Talk About Jackets

The "Adams" line of foundry production items includes:

JOLT-SQUEEZE-MOLDING MACHINES, SIDE ROD TYPE AND POST TYPE

JOLT-SQUEEZE-PATTERN-DRAW MOLDING MACHINES, SIDE ROD TYPE AND POST TYPE

HAND OPERATED SQUEEZERS

SNAP FLASKS—SLIP FLASKS

JACKETS, CAST IRON AND STEEL

BANDS, STEEL—MATCH FRAMES

PRESSER BOARDS—BOTTOM PLATES

VIBRATORS—TUBULAR SPRUE CUTTERS

ADAMS STEEL JACKET

The purpose of a jacket is, of course, to protect the mold during the pouring process, guarding against swells and run-outs.

To perform this function, the jacket must not only possess rigidity, but it must also conform exactly to the shape of the mold, yet light weight is a decided advantage.

The unique patented construction of the Adams Cast Iron Jacket, combining horizontal and vertical corrugations, provides great strength and rigidity with minimum weight. Inner surfaces are accurately surface ground, and assembly is made on a fixture to exact size and to assure correct taper in the case of tapered jackets.

If you prefer Steel Jackets, we have them. Regardless of your preference, specify Adams Jackets for proper mold protection.

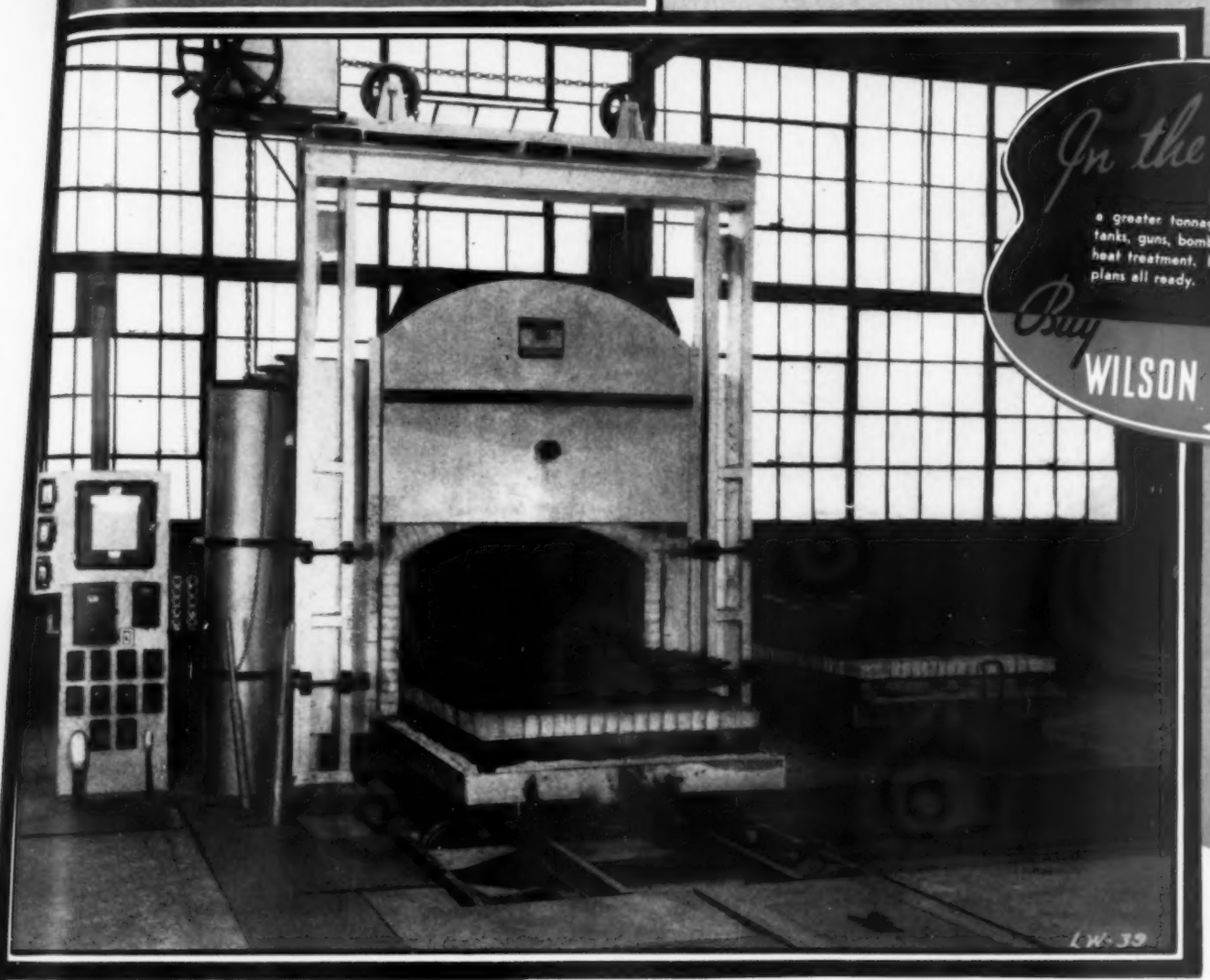
The Adams Company

1883 — Our 59th Year — 1942

800 Foster St., Dubuque, Iowa

MOLDING MACHINES — ADAMS — FLASK EQUIPMENT

WILSON HEAT TREATING FURNACES



In the future

a greater tonnage of castings for ships, tanks, guns, bombs, and shells will require heat treatment. Investigate now and have plans all ready.

Buy WILSON FURNACES

A Wilson Installation of a Car Bottom Furnace with Transfer Mechanism, at the Crucible Steel Casting Company, Cleveland, Ohio.

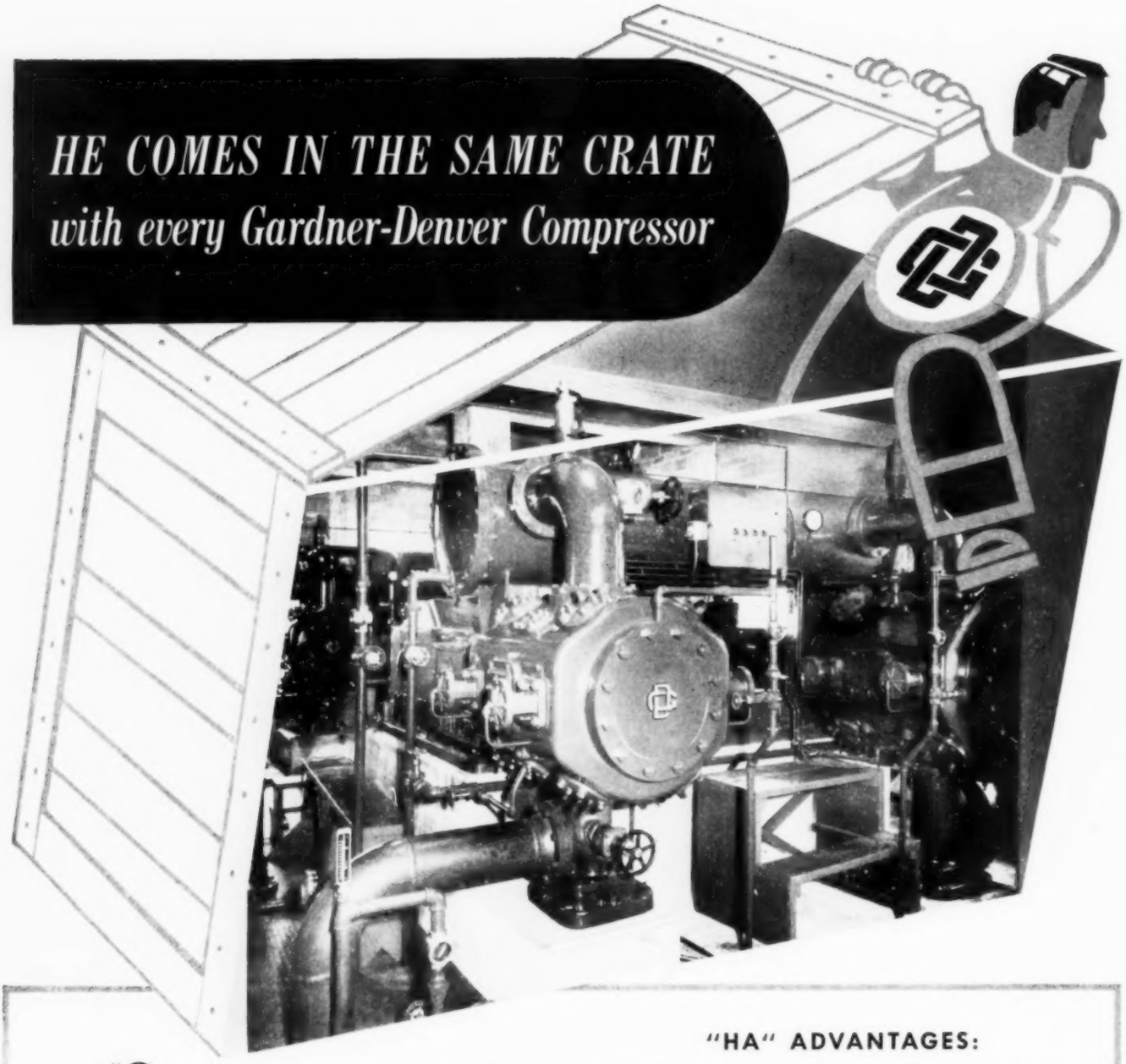
STEEL castings vital to war needs are being normalized and annealed in this gas fired furnace. Precision in physical properties can only be obtained by controlled uniform heating.

LABOR saving in handling is important, too, because now more than ever, manpower must be made available for the work that only men can do.

LEE WILSON
SALES CORPORATION
1370 BLOUNT ST. · CLEVELAND, OHIO

The soldiers are doing their part.
Do yours by purchasing Defense Bonds TODAY!

HE COMES IN THE SAME CRATE with every Gardner-Denver Compressor



"Gardy" DuMuch is a mighty handy fellow to have around your plant these days. For he represents the extra performance, the extra efficiency—the extra low-cost operation of Gardner-Denver "HA" Two-Stage Horizontal Compressors.

The sustained air output of these compressors is the result of better design, advanced engineering methods and the extensive use of GarDurloy—the modern, high strength cast iron developed by Gardner-Denver metallurgists.

The extra service you'll get with a Gardner-Denver "HA" compressor in your plant is attested by scores of user reports from all parts of the country. For full information, write Gardner-Denver Company, Quincy, Ill.

"HA" ADVANTAGES:

1. Frames, cylinders, pistons and other vital parts of Gar-Durloy for added strength and hardness.
2. Unrestricted air passages and large valve areas assure high overall efficiency.
3. Larger water jacket areas assure a cooler compressor.
4. Timken main bearings provide an unchanging air gap for the life of the machine.
5. Capacities from 468 to 1854 cubic feet displacement per minute.

GARDNER-DENVER PRODUCTS HELP SPEED DEFENSE

TYPICAL USER-REPORT: "Our 'HA' has operated 24 hours per day, 7 days per week for the past eight years, and has required only routine attention. Roller main bearings have never been touched at any time."

GARDNER-DENVER *Since 1859*

IN THE THEN UNPRECEDENTED IRON AND STEEL PRODUCTION OF 1940, THE FERRO-ALLOYS INDUSTRY MET EVERY DEMAND PROMPTLY AND WITHOUT DIFFICULTY, WHICH WAS A TRUE INDICATION OF NO LACK IN PRODUCTIVE CAPACITY.

NOTWITHSTANDING HEAVILY EXPANDED PRODUCTION OF FERRO-ALLOYS IN 1941, THE MAKING OF UPWARDS OF NINETY MILLION TONS OF IRON AND STEEL, ABSORBED THE ENTIRE SUPPLY AND BROUGHT THE UNITED STATES GOVERNMENT INTO THE PICTURE MORE OR LESS AS A CONTROL AND DISTRIBUTING AGENCY.

IN 1942, A STILL GREATER PORTION OF OUR SUPPLY MUST GO TO THE ALL-OUT WAR PROGRAM. PRIORITY AND ALLOCATION WILL PRACTICALLY CONTROL THE DISTRIBUTION, LEAVING AS OUR DUTY, THE GREATEST POSSIBLE PRODUCTION TO HELP PROVIDE FOR THE EXISTING VITAL NEEDS.

Ohio Ferro-Alloys Corporation

Canton, Ohio

FROM 2 OUNCES TO 200,000 POU

HYDRO-BLAST G

ONWARD TO VICTORY

FLEET TACTICS
Heavy Cruisers in column during recent maneuvers off California Coast, as viewed from the deck of a destroyer.
Official U. S. Navy Photograph

HYDRO-BLAST Performs These Operations Without Creating Dust

1. Cleans Castings Cleaner.
2. Knocks out hard, complex cores.
3. Washes, reclaims and dries waste sand for re-use.
4. Eliminates sand chipping.

Creates a better place to work.

POUNDS • *Magnesium... Aluminum... Brass... Gray Iron... Steel*

T GOES "*All Out*" FOR VICTORY

Cleans Castings FASTER AND BETTER

Removes Cores; Washes and Reclaims All Valuable Sand

YESTERDAY: Born of a depression when drastic economies are the only assurance of profit, the *Hydro-Blast* system for cleaning castings, and washing and recovering sand that previously had been wasted, enabled foundrymen to perform these essential operations faster, better and more economically.

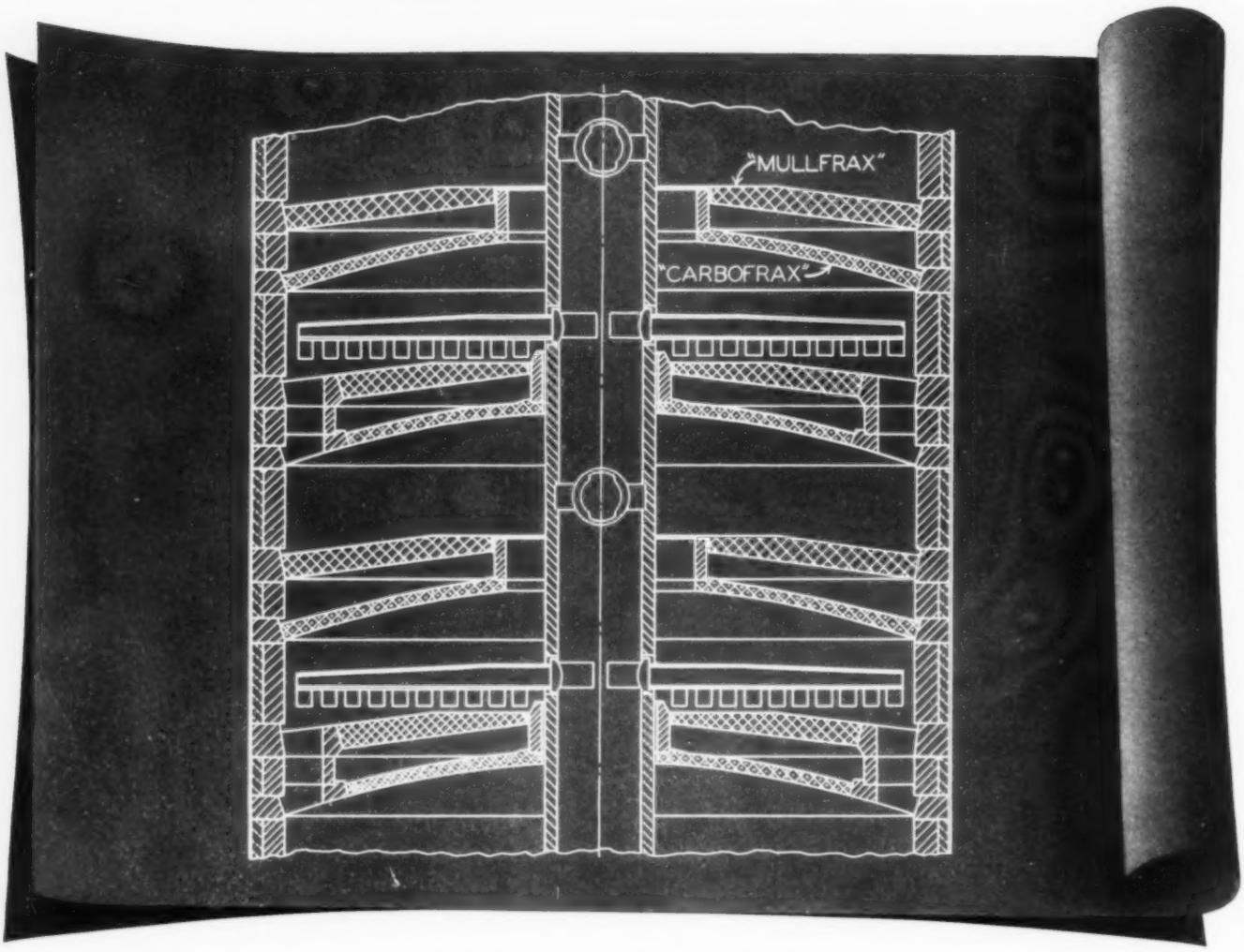
TODAY: *Hydro-Blast* is rendering "All-Out" service in the manufacture of guns, gun mounts, gun turrets, airplane castings, machine tools, marine diesels and steam engines, railroad castings and many other essential war products. And the U. S. Navy, on the alert for more efficient methods, uses *Hydro-Blast* to obtain the same speed, efficiencies and economies which established records for changing casting cleaning losses into profits. Our Navy and other Defense industries are maintaining peak production schedules with this modern method.

TOMORROW: What we learned yesterday and are practicing today will be more important than ever. The end of "Billions for Defense" must come; the sooner the better. And on that Victorious day, the need for *Hydro-Blast's* more efficient and more economical methods will be greater than ever before. A *Hydro-Blast* system installed now will offer the same savings, the same efficiencies, the same profits for which it has won industry's recognition. It will earn today what may well keep many American foundries in business tomorrow.

The HYDRO-BLAST *Corporation*

Dustless Core Removal · Surface Cleaning · Sand Recovery

3118 CLYBOURN AVENUE • CHICAGO, ILLINOIS



They asked us what we could do for them . . . AND WE DID IT!

"A 20 foot diameter muffled multiple hearth roaster to operate at a maximum temperature of 2450° F. in the combustion chamber, with a working chamber temperature of 1800° F. Muffle arches to have the highest possible heat conductivity. Hearths must resist chemical action and carry the weight of the charge. Both hearths and arches must be self-supporting."

This was the problem one of our customers brought to us for our recommendation. It was a tough one. Muffled multiple hearth furnaces previously built had been designed for comparatively low temperature operation and most of them were of very limited size. High temperature operation of such a large unit introduced new problems of design and made necessary a careful selection of refractories.

The design we recommended was based on successful experience in many different fields. Our refractory specifications . . . "Carbofrax" (silicon carbide) arches to provide maximum heat transfer and "Mullfrax" (electric furnace mullite) for the hearths to give longest life and greatest resistance to the action of the charge . . . were possible because of our complete knowledge of the characteristics and properties of these materials. And the further specification of several variations of these materials for different portions of the furnace was the result of extensive research and of application experience gained in over a quarter century of super-refractory manufacture.

The performance of these refractories under severe conditions has been a complete success in every way.

It's another illustration of what the extensive engineering research and production facilities of The Carborundum Company can do to solve the refractory problems of industry.

The Carborundum Company, Refractory Division, Perth Amboy, New Jersey.

District Sales Branches: Chicago, Philadelphia, Detroit, Cleveland, Boston, Pittsburgh. Distributors: McConnell Sales and Engineering Corporation, Birmingham, Ala.; Christy Fire Brick Company, St. Louis, Mo.; Harrison & Company, Salt Lake City, Utah; Pacific Abrasive Supply Company, Los Angeles, San Francisco, Calif.; Denver Fireclay Company, El Paso, Texas; Smith-Sharpe Company, Minneapolis, Minn.

(Carborundum, Carbofrax and Mullfrax are registered trade-marks of and indicate manufacture by The Carborundum Company)

REFRACTORY CARBORUNDUM PRODUCTS

Get the most out of your Air Tools . . .

Check . . .

AIR LINES
PIPE CONNECTIONS
HOSE FITTINGS

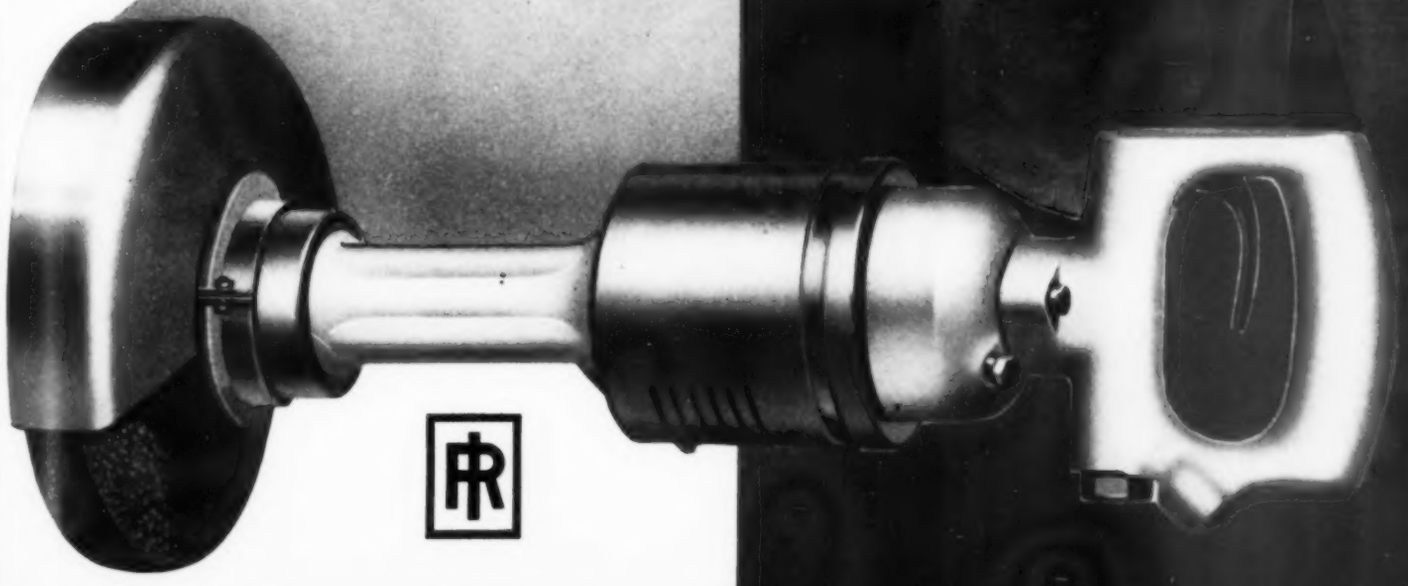
The transmission of compressed air is so simple that it is too often taken for granted. It is extremely important to maintain adequate air pressure at the tools. They will often do 40% more work with 90 lbs. air than with 70 lbs. air. Make periodic checks on your air lines.

Reduce friction losses by using adequate hose and pipe sizes. Keep them short and avoid unnecessarily long or small fittings which cause a sharp reduction in pressure.

A little checking here and there throughout the plant will greatly improve the effectiveness of your tools. Why not make it one man's job to look into this matter?

Ingersoll-Rand

11 BROADWAY, NEW YORK CITY



MAINTAIN 90-LB. AIR PRESSURE FOR BEST RESULTS

RESINOID BONDED WHEELS BY BAY STATE

BUILT TO BEAT PRODUCTION SCHEDULES . . . . . .

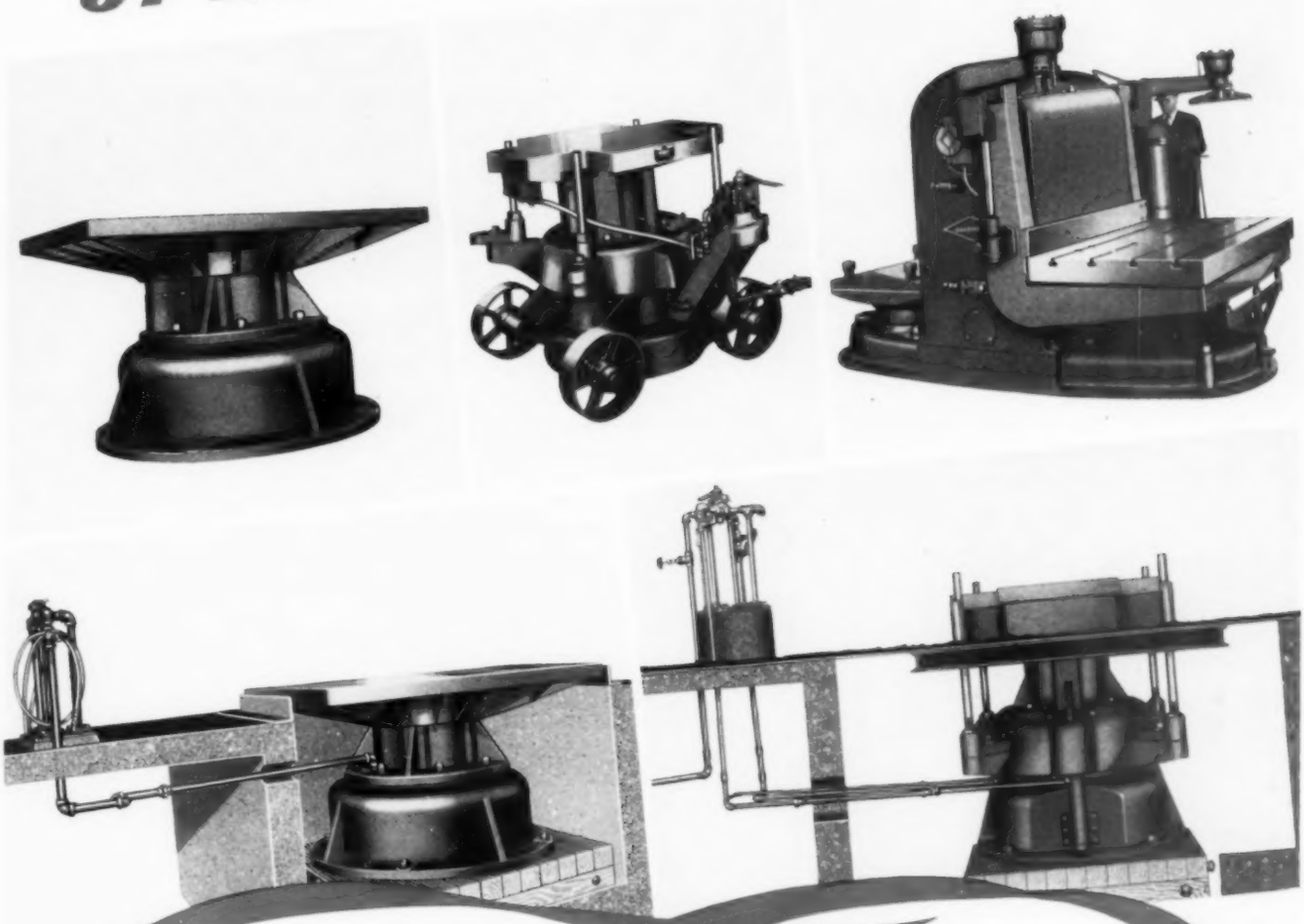
It's for just such rugged, continual use that BAY STATE resinoid bonded products are manufactured.

You know you're equipping your machines with the best when you use BAY STATE products because a high quality reputation supports your selection.

On to victory with more production! That's your aim and ours. March along with BAY STATE!

BAY STATE ABRASIVE PRODUCTS CO.
WESTBORO, MASSACHUSETTS, U. S. A.

SPEED and ACCURACY!



"DAVENPORT" MOLDING MACHINES

"DAVENPORT"
LINE OF MOLDING MACHINES

★ **JOLT ROLLOVER DRAW MACHINE**
Model SA (Seven sizes)
Capacity from 750 to 12,000 lbs.
Model A (Six sizes)
Capacity from 1,000 to 12,000 lbs.

★ **JOLT STRIPPER OR PUSH-OFF MACHINES WITH ADJUSTABLE LIFT PINS**
Six sizes.
Capacity from 1,000 to 10,000 lbs.

★ **PLAIN JOLT MACHINES**
Fourteen sizes.
Capacity from 200 to 25,000 lbs.

MODERN foundry molding calls for speed and accuracy unheard of a few years ago. "Davenport" Molding Machines in the foundries of America report the following advantages:

1. **Precision results**
2. **Remarkable dependability**
3. **Cleaner castings**
4. **Increased production**

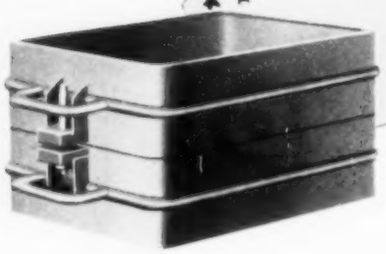
The self-cleaning Striking Pad, the Valveless Air Jolt, the sturdy Construction, the simplicity of Engineering—give the "Davenport" users a decided advantage in meeting all competition.

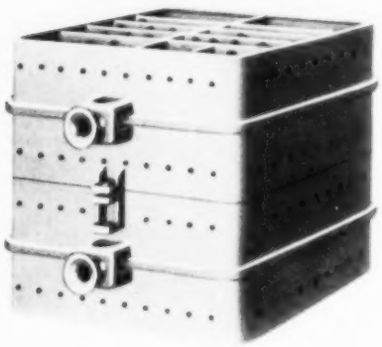
Before you buy, be sure and know why "Davenport" molding machines are the finest molding machines built in America today!

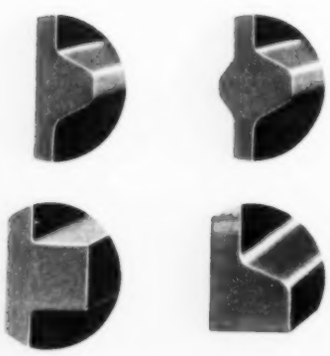
Write today for our NEW 1942 Catalog

DAVENPORT MACHINE & FOUNDRY CO.
DAVENPORT, IOWA, U. S. A.

They're all over the map!







Patent No. 1974292

ROLLED STEEL WITH SOLID CENTER REINFORCING RIB AND SQUARE FLANGES; FULL WIDTH BEARING

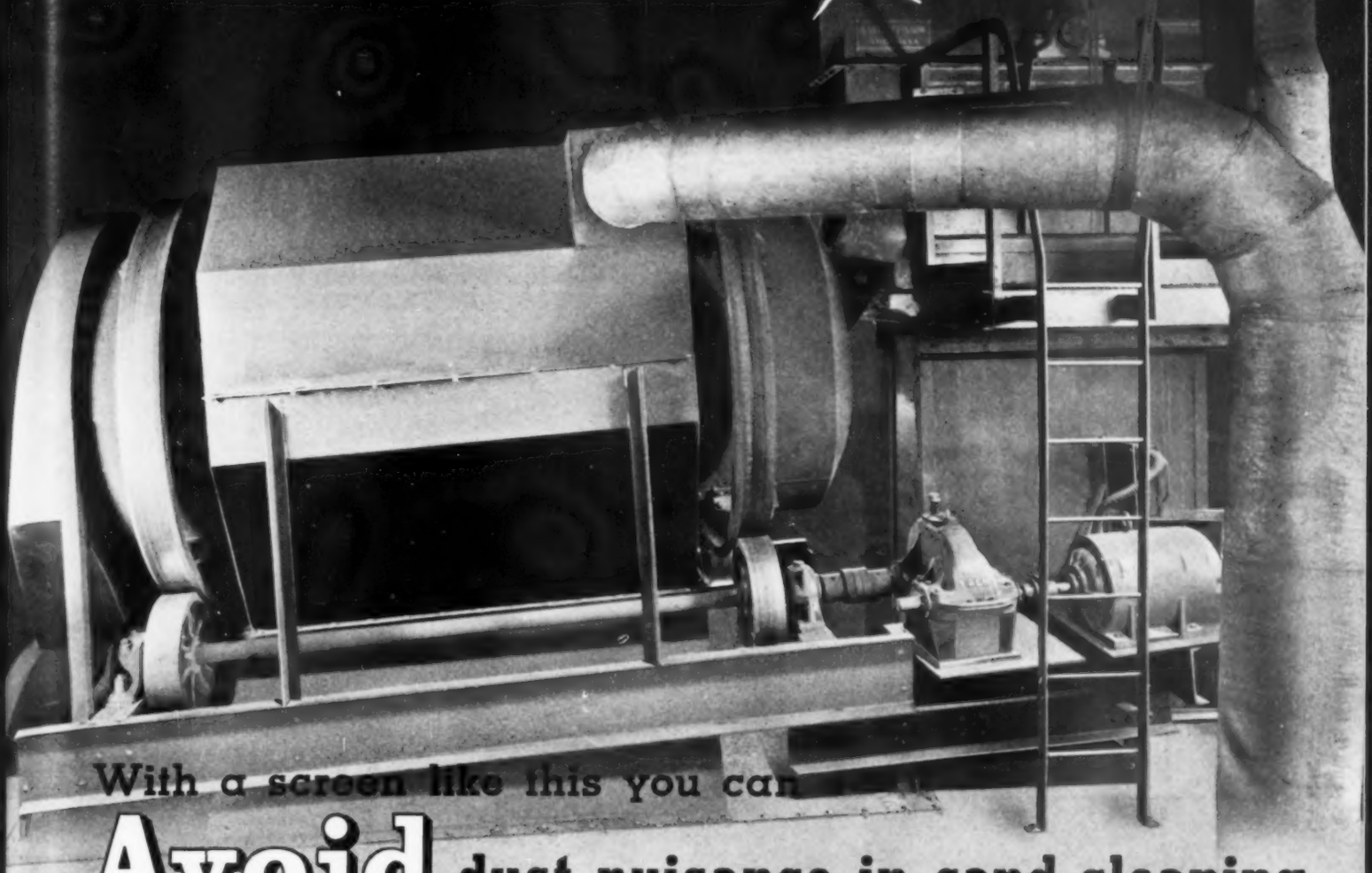
YOU never have to go far to find some one who can tell you just how Sterling flasks perform in actual service. You can find them in use today by up and coming foundries in every corner of the country.

Sterling Flasks are made in many sizes, styles and shapes. And every one is built from copper bearing steel from one piece rolled steel sections that give full width bearings and solid center ribs. All welded construction and dozens of design features that speed up production have made them a favorite with leading foundries every place.

Sterling
WHEELBARROW COMPANY
7100 W. WALKER STREET
MILWAUKEE, WISCONSIN

cleaning up afterward

Prevention is better than ~~cure~~



With a screen like this you can

Avoid dust nuisance in sand-cleaning

● Fully housed in and vented to a dust collector, this revolving screen in the plant of one of the country's nationally known radiator manufacturers cleans 60 tons of sand an hour with almost no dust loss at all. Flights on the inside lift the sand and drop it against the bottom breaking up the lumps. The screen may be provided if desired with a breaker section to break up extremely heavy, hard packed molds, also with an interior exhaust pipe for removal of fines. These screens are usually mounted overhead to save floor space but they may be placed at floor level. They handle dry, wet, hot, cold or any intermediate condition of sand and are available in sizes from 30″ to 84″ in diameter and different lengths to meet various requirements—eliminating any dust nuisance from sand cleaning at its source. Complete details, including prices, weights, capacities, etc., furnished on request.

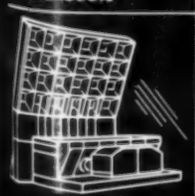
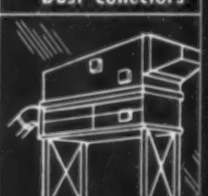
THE C. O. BARTLETT & SNOW COMPANY

30 Church Street NEW YORK · 6201 Harvard Avenue CLEVELAND · First Natl. Bank Bldg. CHICAGO

BARTLETT-SNOW

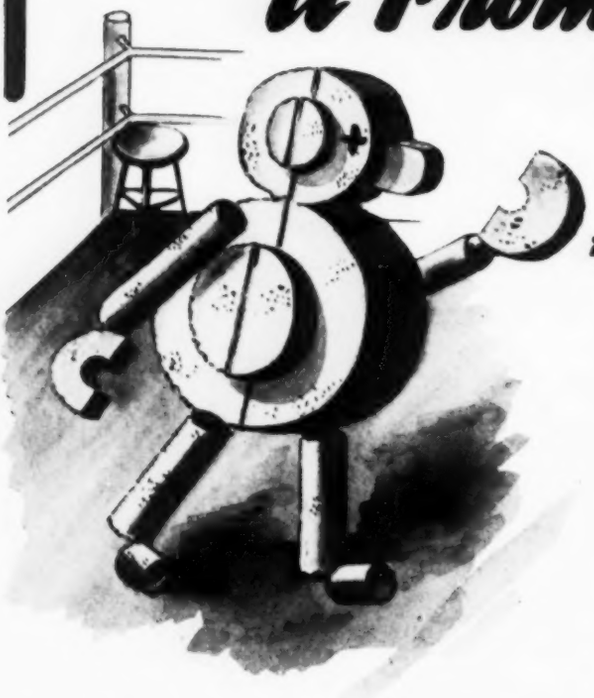
ENGINEERS AND FABRICATORS FOR THE FOUNDRY INDUSTRY

Complete Sand, Mold and Castings Handling Equipment for any requirement, including

Shakeouts	Elevators	Aerators	Sand Distributors	Bins and Feeders	Apron Conveyors	Dust Collectors
						

A Promising Start...

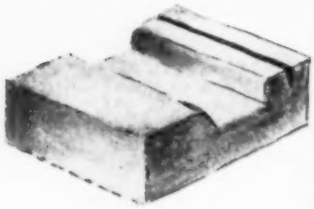
BUT IT'S CURTAINS FOR THIS FELLOW!



SHOT TO PIECES BECAUSE OF POOR TREATMENT!

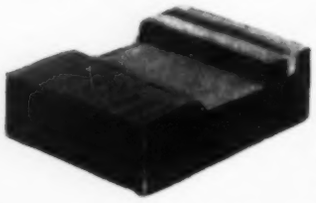
He promised to be a hard, enduring fellow in anybody's ring. He had the right stuff to stand up against the heat of many tough rounds . . . but it's curtains . . . and WHY? Simply a case of improper treatment. In foundry language, that means the best cores in the world can be ruined in a poor oven. In addition to the selection of good binder, the careful choice of sands and the good molding of cores, you need proper baking to assure "perfect cores."

AVOID GREEN CORES

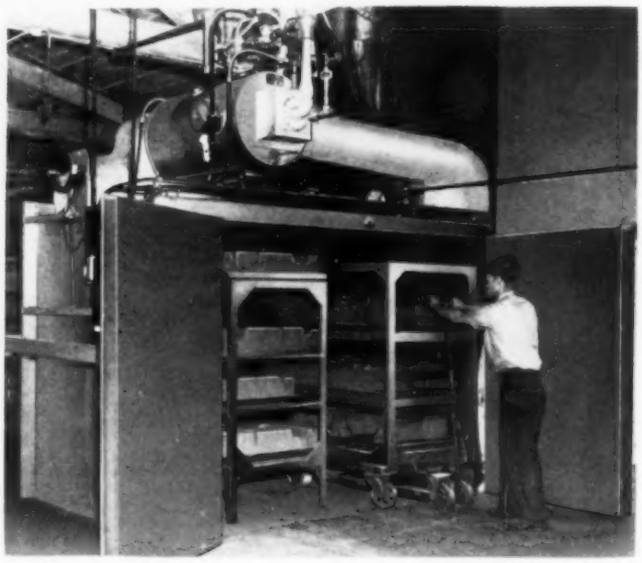


Green cores will produce imperfect castings . . . a great waste of time and money. Green cores are absolutely unnecessary, because it is just as easy and speedy to bake cores thoroughly and uniformly in a Despatch Oven.

ELIMINATE BURNT CORES



Burnt cores will collapse and destroy castings. A real dark brown or black exterior on cores means they were burnt—probably baked in a hot spot in an oven. The interior will probably still be green. Despatch core oven uniformity eliminates burnt cores and assures perfect baking for every core in the load.

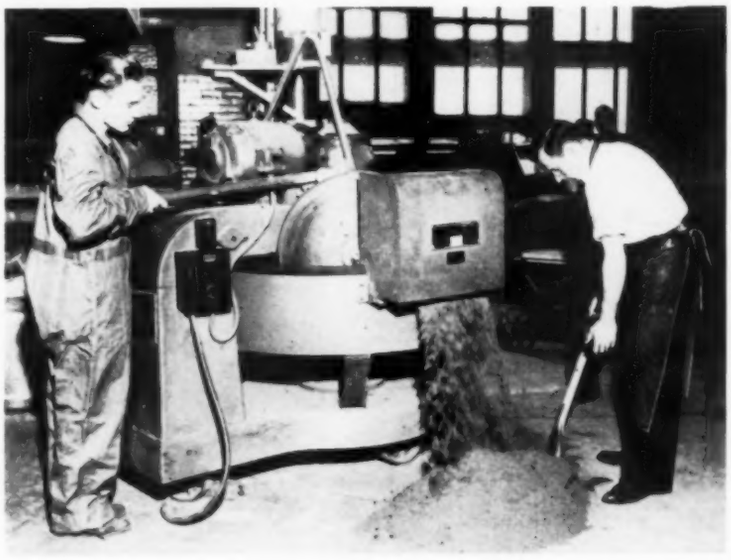


Despatch Ovens have a record of baking cores perfectly under all loading conditions. The Despatch principle of horizontal heat flow provides heat uniformly to every core and allows both large and small cores to be baked in the same oven. Despatch ovens also increase core output and greatly reduce operating costs. There is a Despatch Oven for every foundry need.

WRITE TODAY FOR BULLETIN NO. 31
for complete information on Despatch Core and Mold Ovens, their unique design, and photos of recent installations.

DESPATCH
OVEN COMPANY MINNEAPOLIS, MINNESOTA

"VERY GOOD CORES" *says Mr. Schroeder*



These pictures taken at the Washburne Trade School, Chicago, show their Clearfield Mixer at work, and some of the cores produced from it. Mr. Roy Schroeder, Foundry Instructor, tells us: "Very good cores are made by students with sand prepared in the Clearfield. It makes nice facings too,—no lumps or packed sand."

In big foundries and small the story is the same. There is a Clearfield for every sand preparing job.

CLEARFIELD
MACHINE COMPANY
CLEARFIELD
PENNSYLVANIA, U. S. A.

A *Real* INVESTMENT FOR MORE PRODUCTION!

DIAMOND FLASKS

No matter what happens—you'll never be wrong if you equip for production with *good* flasks. Because we can give you many exclusive features in a flask developed over a period of 50 years, it can also be said that, "You can't go wrong on a Diamond," either. Note these important features:

■ **A SUPERIOR LATCH** (exclusive)

It's self-compensating for wear. The tighter you draw it, the firmer the grip. Has special cam which is easily adjustable as extreme wear on parts develops. Only *Diamond* has this patented feature.

■ **PRECISION-MADE**

Made from the finest grade of well-seasoned cherry stock, all flasks are made to precise measurements according to your specifications.

■ **A PATENTED HINGE** (exclusive)

Note the construction of Diamond hinges. The lugs are carefully milled and are interlocking which eliminates "play" no matter how long or how hard the flask is used.

■ **SPECIAL SHAPES**

We regularly supply customers with special shape flasks, including round flasks, and special cut partings.

STEEL JACKETS

Made from Nos. 7 to 10 gauge steel, true to size and taper. Are practically indestructible, and retain their shape under severest conditions. Thousands of these jackets in use.

DIAMOND

CLAMP AND FLASK COMPANY

Telephone 2553 **Richmond, Indiana**

Designers of* CORE PLATES, JACKETS, BANDS, FLASKS *since 1889

CLEVELAND PNEUMATIC TOOL

adds sales and service branches, expands plant capacity

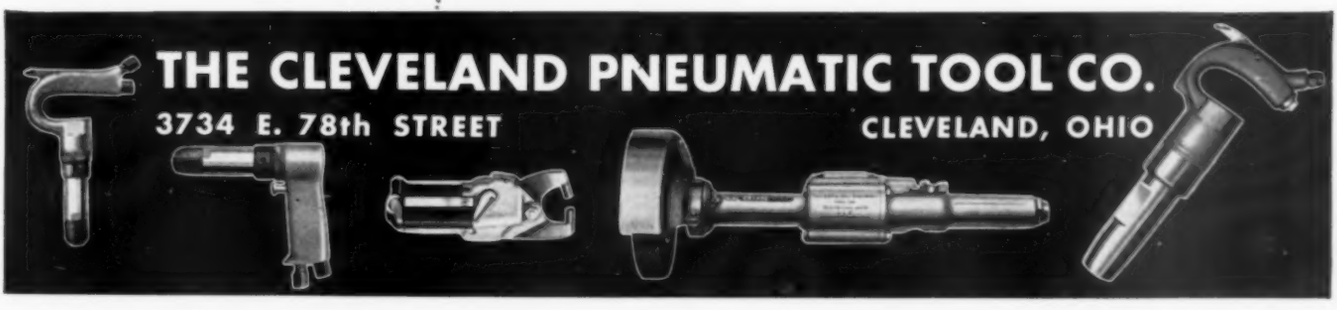
TO GIVE YOU *still better service!*

REALIZING more than 2 years ago that defense production would enormously increase the demand for pneumatic tools, we began a carefully planned program of expansion. By steadily increasing our personnel and plant capacity, Cleco Pneumatic Tool production has gone up over 300%. To facilitate our service still further, numerous branch offices have been added. As shown on the map above, our sales and service facilities are available in all parts of the country.

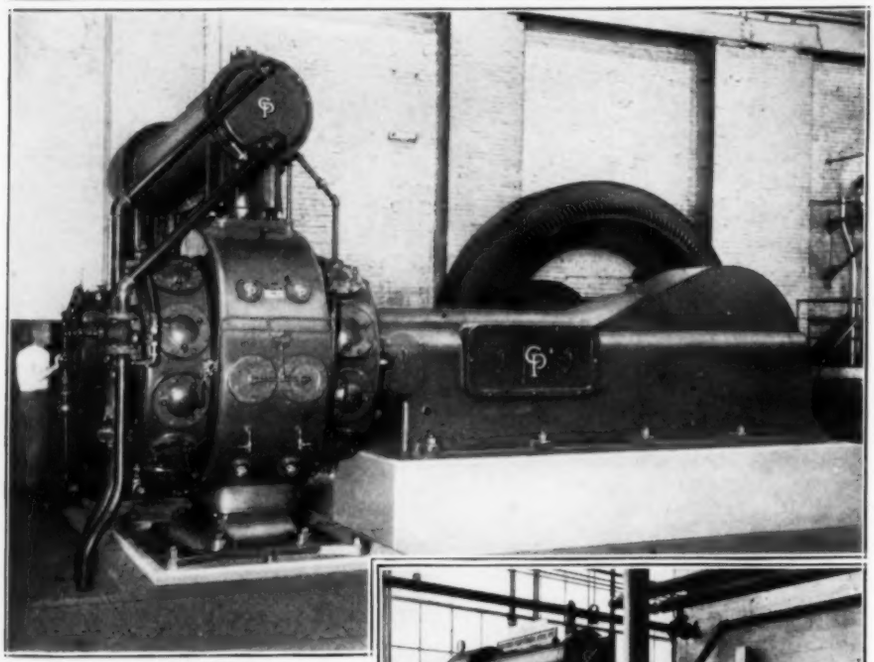
With all this growth, the superior quality of Cleco Tools has been carefully maintained. Today, Cleco Chippers, Riveters, Sand Rammers, Drills and Grinders, have the same outstanding reputation that has made them famous for over 40 years.

Now that war is upon us, and the nation cries for production and still more production, you can count on Cleveland Pneumatic for fast, thorough service in meeting your tool requirements.

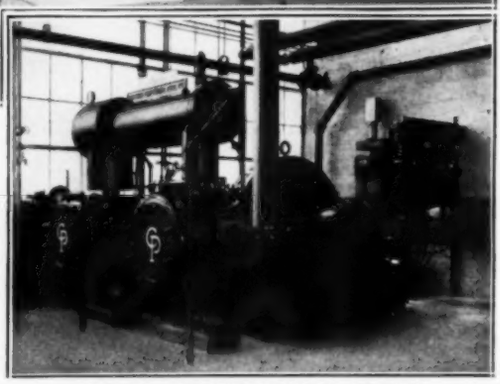
Write for complete information on Cleco Pneumatic Tools



O-CE COMPRESSORS TO DEFENSE PLANTS



↑ **WITHIN A FEW MONTHS,** thirty-five Chicago Pneumatic O-CE Horizontal-Duplex Compressors were installed in well-known shipyards. This popular compressor is available in capacities of 350 to 10,000 c.f.m.



SYNCHRONOUS MOTOR-DRIVEN → O-CE Compressor, 800 c.f.m. piston displacement, in well-known aircraft plant. Simple, efficient, five-step regulation varies the output to meet load.

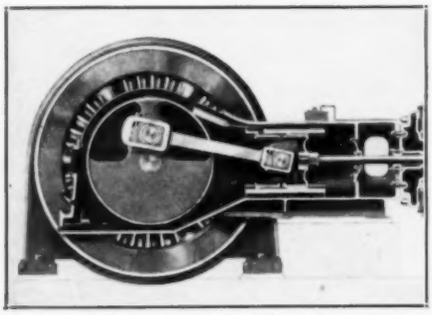
EIGHT 6,000 C.F.M. COMPRESSORS RUSHED TO EASTERN SHIPYARDS

Model Noted For Dependability

NEW YORK—Familiar equipment in new shipyards, aircraft factories and other defense plants are Chicago Pneumatic O-CE Horizontal-Duplex Compressors. Sound in design and ruggedly built, these popular compressors are ideal for continuous, heavy duty operation. The large effective area of their well-known Simplate Valves insures minimum power consumption. Their five-step regulation, low maintenance cost, outstanding reliability and other CP features make them the logical selection for plants which must have dependable, 24-hour-a-day air power.

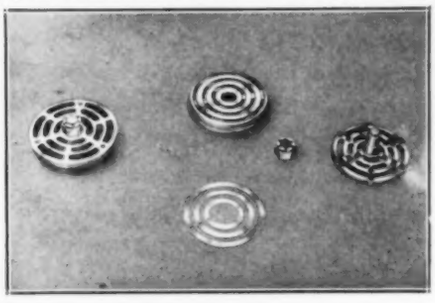
CHICAGO PNEUMATIC TOOL COMPANY

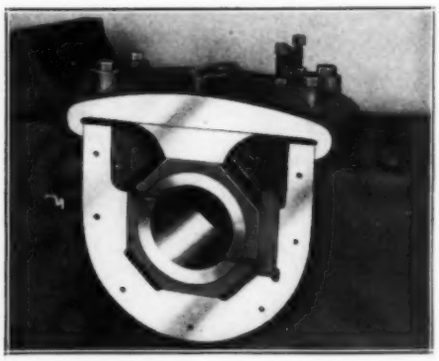
General Offices: 6 E. 44th St., New York, N. Y.



↑ **CP FLOOD SYSTEM OF LUBRICATION** assures maximum reliability. No pump or other working parts to fail and endanger running gear; no small oil lines to clog. This method provides all bearings with a copious supply of oil which also serves as a coolant and returns to the pump to be used again.

ACTUAL MEASUREMENTS PROVE that CP Simplate Valves, with their annular ports and straight, uniform lift, possess the greatest effective area for a given valve diameter, thus assuring lower power consumption. Straight valve lift, together with low air velocities resulting from large effective area, account for the remarkable endurance of these valves. ↓





↑ **MAIN BEARINGS** of two-piece design are easy to align and adjust—vertically by shims, and horizontally by wedges. Can be adjusted with the machine in operation; can be removed and replaced without lifting out the shaft.

CHICAGO PNEUMATIC

AIR COMPRESSORS

ALSO: Pneumatic Tools, Electric Tools, Rock Drills, Hydraulic Aviation Accessories, Diesel Engines

PORTABLE
STATIONARY
AIR OR GAS
MOTOR DRIVEN
STEAM DRIVEN
DIESEL ENGINE
DRIVEN

"Hay! We are not this slow!

Our expanded facilities and efficient organization offer you . . . . . .

Remarkably fast deliveries on North American Burners, Mixers, Regulators, Valves and Accessories.

If you are looking for dependable Combustion Equipment in a hurry, we invite you to try

Combustion Equipment by

NORTH AMERICAN

THE NORTH AMERICAN MANUFACTURING COMPANY

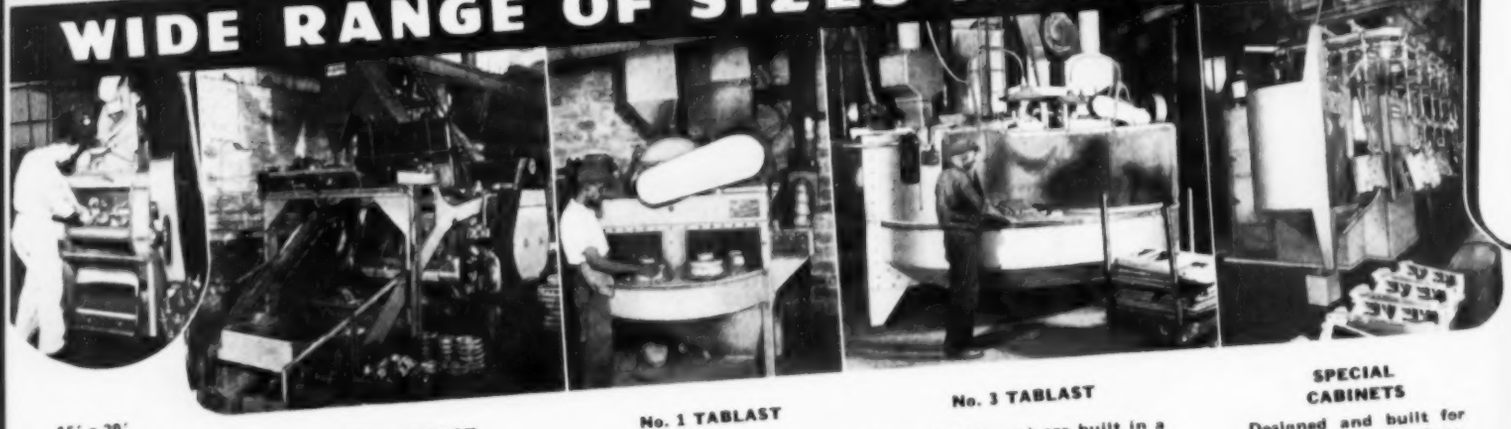
MANUFACTURERS OF INDUSTRIAL FUEL BURNING EQUIPMENT FOR GAS OR OIL

CLEVELAND, OHIO

BRANCH OFFICES WITH FACTORY TRAINED REPRESENTATIVES IN PRINCIPAL CITIES

FIRST IN WAR
FIRST IN PEACE
FIRST

WIDE RANGE OF SIZES AVAILABLE



15' x 20' TUMBLAST

48' x 72' TUMBLAST

Tumblasts are built in 7 sizes ranging from 1 cu. ft. up to and including 30 cu. ft. operating load capacity.

No. 1 TABLAST

No. 3 TABLAST

Tablasts (Multi-table and Plain table types) are built in a wide variety of sizes for handling flat or fragile work of practically any dimension.

SPECIAL CABINETS

Designed and built for handling special and unusual cleaning problems of all kinds.

WHEELABRATOR *Airless* ABRASIVE

THE PLANTS OF OVER 1300 USERS

GENERAL FORREST—"the Fox" of Civil War fame—gave this prescription for winning battles: "Get there furstest with the mos' men." And it worked! Today he would be the first to modernize his famous slogan by including the crushing power of "mechanized equipment."

To get this equipment to our theatres of war quickly and in large quantities is the tremendous problem of the moment. Nothing must delay—even the slightest—the constant stream of matériel to our fighting forces.

In war, as in peace, the airless WHEELABRATOR is saving precious minutes and hours for hundreds of plants producing shells, bombs, tanks, airplane engines, guns, armament and other vital war necessities.

But it goes even further than saving time in this important work: It improves machinability and grinding—it lengthens tool and cutter life—it simplifies inspection—it provides a perfect bond for final finishes—it conserves power, space and labor—it is a cost-saver in every respect.

For distinguished service use airless WHEELABRATOR speed-cleaning—more than 1300 important plants depend upon it!

a STEEL Foundry *Says:* "We have saved 75% of our labor in cleaning and due to cleaner castings have saved the time of our cutters in cutting off gates and risers. The time of our sand blast room has been cut from twenty-four to eight hours."

a NON-FERROUS Foundry *Says:* "The cost of operation and repairs is very nominal in comparison with the old sand blast method and the output is approximately three times as great. The castings are thoroughly cleaned and the appearance greatly improved."

a MALLEABLE Foundry *Says:* "Our 36" x 42" WHEELABRATOR Tumblast has been operating very satisfactorily, cleaning ten to twelve tons of malleable castings per day at a low cost per ton, lower than we have ever cleaned castings."

a GREY IRON Foundry *Says:* "The WHEELABRATOR does a fine job and still leaves us with some excess capacity in our cleaning department. We are particularly pleased with the nice finish on the castings. They look like aluminum instead of gray iron."

REPEAT USERS

	No. of Machines
General Motors Corp.	82
Ford Motor Co.	57
Curtiss-Wright Corp.	38
International Harvester Co., Inc.	34
Firestone Tire & Rubber Co.	23
General Electric Co.	21
Timken Corporation	18
Natl. Mall. & Steel Castings Co.	18
Chrysler Corp.	16
Magnus Metal Div.	15
Borg-Warner Corp.	14
Campbell, Wyant & Cannon Foundry Co.	12
Eastern Mall. Iron Corp.	11
Eaton Mfg. Co.	11
Kelsey Hayes Wheel Co.	11
U. S. Government	11
Associated Spring Corp.	10
Bendix Aviation Corp.	10
Spicer Mfg. Corp.	10
Wyman-Gordon Co.	9
Amtorg Trading Corp.	8
American Brake Shoe & Fdry.	8
Allis-Chalmers Mfg. Co.	7
Crane Company	6
Bethlehem Steel Corp.	6
Thompson Aircraft Prod. Co.	6
Fedders Mfg. Co.	6
Belle City Mall. Iron Co.	5
General Metals Corp.	5
Hallstead Iron Fdry.	5
Auto Specialties Mfg. Co.	5
Studebaker Corp.	5

and 148 other plants have from 2 to 5 machines each.

TRADE MARK THE AMERICAN MOLDER

AMERICAN FOUNDRY EQUIPMENT CO.

505 S. BYRKIT ST. MISHAWAKA, IND.

E BLAST EQUIPMENT ★★★

Here comes some of *Your* Pig Iron

Your pig iron? Yes, it's the same kind of pig iron you've been using, may now be using in *Production for Victory*—and the very same pig iron you still might have been using to produce castings for civilian goods. But the qualities of Republic Pig Iron are the very ones essential for castings necessary for tank construction.

Republic Pig Iron includes a full line of basic, foundry and malleable iron processed from northern ore—foundry and basic from southern ore—and the iron that "works wonders in foundries," low-phosphorus, copper-free Chateaugay, made from the purest known iron ore in the world. The uniform melting, pouring and solidifying characteristics of all of these grades mean a consistently high output of sound, flawless castings wherever Republic Pig Iron is used.

Eventually, the experience gained through the use of these irons in defense equipment combined with our continued research should result in better iron than ever before. And our metallurgists, as heretofore and now, will be "always at your elbow" to help you obtain best results with Republic Pig Iron.

Put Republic Pig Iron down in your mental file as a profit producer—for future reference.

REPUBLIC STEEL CORPORATION
General Offices: Cleveland, Ohio

Berger Manufacturing Division • Culvert Division
Niles Steel Products Division • Steel and Tubes Division
Union Drawn Steel Division • Truscon Steel Company

Photograph by Signal Corps, U. S. Army

PIG IRON—*a product of*

REPUBLIC STEEL

THE FOUNDRY

EDITORIAL

Time Most Important Factor In Battle of Production

PRESIDENT ROOSEVELT, in his recent message to the Congress on the state of the nation, has presented an enormous production goal for industrial America in the initial drive to win the war. Demands of this all out war effort provide a breath-taking challenge to the men and women of this country, to management and labor, and to government and industry. But this challenge must be met in full if victory is to be ours.

To win the first battle—the battle of production—the industry of this country must have available all of its resources in skilled men, materials and machines. To meet the production schedules which have been established by the President, every other activity must be subservient to war. With Donald Nelson as chairman of the new War Production Board and in complete direction of all production, it is certain the manufacture of the machines of war will take precedence over all other needs.

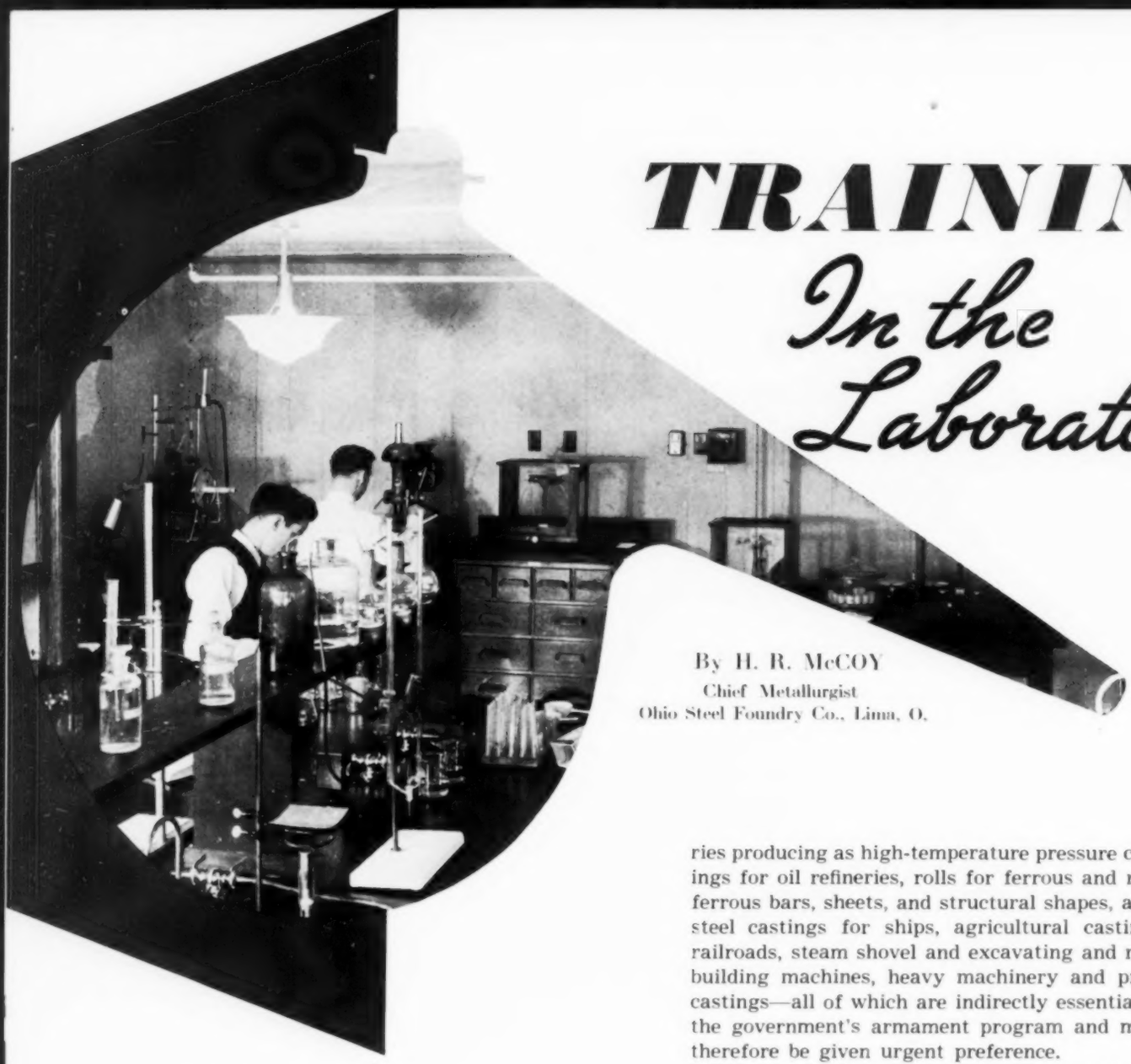
Problems of the foundry industry under the new goal of production are multiplied many fold. While accelerated demand for castings, shortages of materials, and priorities controlling distribution made the past year one of continuous struggle for many foundries, the real problems of the industry are just beginning. Because the machines of modern warfare utilize only certain types of castings in large quantities, and because all branches of the industry have not taken time in the past to tell engineers everywhere, including those in the army and navy, of the valuable engineering properties of castings, the foundry industry now is faced with a complicated situation. While many plants will be unable to meet these new demands for highly specialized castings, others will be forced to close because of inability to secure war work or obtain the needed materials for civilian production.

The time has arrived for all concerned with the production of castings, both in the foundry industry and in the government, to view the present difficult situation in a most realistic manner. Expediency must govern the thinking of castings manufacturers, the OPM, the army and the navy. Before plans are made to pyramid the expansion of production facilities through the construction of new plants—the type of expansion which cannot be brought into operation for some months to come—every effort must be made to convert or direct to war production existing foundry facilities now engaged in work not directly connected with the war effort and therefore threatened with early shutdown. Such a task may present far more difficulties than would be encountered in designing and building new foundries dedicated to the particular demands of the army and navy. But time is the most important factor in the battle of production, and the foundry industry should be sufficiently flexible to direct all of its energies in the needed channels.

What are some of the measures which might be considered to expedite the production of those castings most needed at present? First of all some effort should be made to relieve the pressure which has been developing in the steel castings industry and which probably will grow as the tank and ship building programs accelerate and products formerly produced as forgings are directed to steel castings because of choke points in the forging industry. This may be accomplished through a careful study of the present use of certain steel castings to see if malleable, pearlitic malleable or gray iron possibly can meet the service requirements of the part. Relief also may be provided by conversion of a greater number of malleable or gray iron shops to the production of steel castings through the installation of converters, heat treating furnaces, and other equipment. In this connection, prompt attention should be given to changing existing specifications to permit the use of converter castings just as long as they meet the physical needs for that product, especially in connection with machine tools, and wherever possible devote the ingenuity of men and facilities of machines to the important problem of helping to meet these needs. Likewise, the ability of numerous nonferrous foundries to render maximum service to the United States in this period of greatest emergency depends upon the alertness of management to sense war needs and the ability of the organization to master new production problems regardless of complicating factors.

Frank G. Steinebach

Editor



TRAINING In the Laboratory

By H. R. McCOY
Chief Metallurgist
Ohio Steel Foundry Co., Lima, O.

PERHAPS never before in the history of our nation has the necessity for rapid and thorough training of laboratory technicians been more urgently required than at present.

Employers already are beginning to find the ranks of their skilled workers being depleted by the call of the selective service for national defense and the lure of higher wages and possible chance for more rapid advancement in one of the many new plants nearing completion for the production of armament and auxiliary equipment required by the government's present gigantic spending program.

That demand for skilled workers, especially those with chemical and metallurgical training already has exceeded the supply, and, as more of the new government spending projects for armament and defense near completion, more and more acute will become the shortage of laboratory workers in industries that are attempting to supply the nation's peace-time requirements along with auxiliary commodities.

Industries in mind more specifically are foundries producing as high-temperature pressure castings for oil refineries, rolls for ferrous and nonferrous bars, sheets, and structural shapes, alloy steel castings for ships, agricultural castings, railroads, steam shovel and excavating and road building machines, heavy machinery and press castings—all of which are indirectly essential to the government's armament program and must therefore be given urgent preference.

Where will these chemists, metallographists, and laboratory technicians be found? In the past industry has called upon the high schools and colleges for fresh recruits and has been able to satisfy its peace-time needs from this source. However, with the present selective service laws and future amendments contemplated the trend indicates the possibility of inducting all young men of high school and college age for at least one year of military training.

Laboratories Need Apprentices

As a result of industry being deprived of workers from these sources employers will soon be bidding for the services of skilled laboratory technicians, chemists and metallurgists unless something is done to meet the demand.

We believe that the only way to solve any future shortage in the ranks of laboratory technicians is to begin to train a few at once so that if the ranks of our present laboratory forces become depleted we will have fresh troops to jump in and take their places. With this in mind we have begun an intensive training program for

APPRENTICES

a number of laboratory apprentices.

Apprentice training of laboratory technicians works both to the advantage of the employer and the young man who is desirous of learning the profession. To a man who has had a high-school education and who is endowed with the proper inherent traits required of first-class laboratory men, it offers interesting pleasant agreeable work with a future limited only by the ability and ambition of the man himself.

In the author's 20 odd years of experience in the steel foundry he has known of several chief chemists, plant managers and vice presidents who began their steel experience washing beakers in the laboratory. Perhaps the person who rose to highest distinction from a humble beginning in the laboratory was the late Charles M. Schwab. This is one of the little appreciated advantages of living in a free democracy such as our great United States of America.

Ambitious Men Will Rise

The ambitious young man who will attend night classes—such as are now given free in practically every technical college and high school of the country as part of the government's contribution to the training of workers in industry for the national defense—and who will ask questions, read the numerous technical and trade journals, and attempt to continually keep abreast of new developments and discoveries, as well as become well-grounded in the fundamentals of chemistry, metallography, or metallurgy. will soon find himself automatically slated for more responsibility at a correspondingly higher rate of remuneration.

From the standpoint of the director

To give laboratory apprentices a sond, fundamental training they must be instructed to perform various operations with care and exactitude under careful supervision. The several illustrations included show views of the laboratory in which the training is conducted

of the laboratory, the greatest difficulty is in picking the proper young man. First of all, under present conditions, we try to give preference and first consideration to those who have been out of high school a few years and who, because of their marital status, or for other reasons, are eligible for deferment from army service.

One way to tell whether the applicant is really in earnest in wanting to learn the profession is to place him on a fairly low rate of pay, to start

Pouring liquid without spilling a drop is accomplished by use of a stirring rod

Another way is to tell him that he must sweep, scrub and polish the tile floors, wash beakers and glassware, run errands, get test-samples, and make himself generally useful through the performance of similar menial tasks until such time as he can get acclimated, acquainted, and become grounded in the fundamentals of the laboratory work.

Many are thus automatically weeded out because they *can't take it*, or, because they feel themselves above these menial tasks, or, because they do not particularly relish the idea of staying at home and *burning the midnight oil* after their day's work has been completed, especially at the low starting wage of 60 cents per hour, purposely made low to eliminate the floater who is *just looking for another job.*

Once having passed his probationary period of a month or so, depending on conditions, and, having demonstrated his inherent aptitude for study and his interest in science and industry, the progress of the apprentice becomes quite rapid because he is given responsibility. He is made to feel that the producing departments such as the melting and heat treating and inspection departments are depending solely on him for the accurate scientific data necessary for the production of quality castings.

If he is selected to begin training in the chemical laboratory, he is *broken in* on the routine chemists work. The head chemist immediately takes him in hand. The first few days are spent in learning how to use the laboratory balances; how to handle beakers properly with stirring rods without breaking them; how to manipulate reagent bottles containing strong acids and alkalis without breakage or spillage.

He is taught how to drill and prepare samples for analysis and as time goes on he actually begins to function as a routine chemist on air furnace and open hearth control work becoming familiar with the determination of carbon and sulphur with the carbon-sulphur determinator combustion method. Later he is taught to determine silicon and manganese; make standard solutions, do titrating, and the many other more or less standard analyses and operations performed in the steel laboratory.

To Work in Harmony

In addition to his adeptness in the cultivation of both speed and accuracy and his ability to go through the actual motions necessary to the performance of these laboratory tasks, his ability to get along with his fellow workers, particularly with those in the iron and steel melting departments constantly is observed. Unless he has the proper personality to instill confidence and be accepted as a careful analyst by the departments whom he serves he eventually will fail to make the grade for he must work in harmony with these men as well as be accurate and trustworthy as a laboratory technician.

If the apprentice is selected to begin training in the process inspection and heat treatment control division, the assistant metallurgist takes him in hand. He is given practical work to do right at the start. He is taken to the machine shops, annealing and heat treating departments, and introduced to those in direct charge. In the machine shop his attention is called to the location of the various machines used in the preparation of metallurgical samples. In the heat treating department he becomes familiar with the routine for handling pilot castings, test bars, and special experimental castings under investigation by the laboratory.

He is assigned the daily task of visiting the saws, shapers, drills, and lathes, where specimens of castings and rolls are being cut up and prepared for the laboratory. His ability to contact the foremen and the diplomacy with which he handles his assignments to get the foremen of these production departments to give his laboratory specimens and (*Please turn to page* 157)

Foundry Congress to Speed PRODUCTION FOR VICTORY

ALL out war has brought home to foundrymen the urgent need for proper dissemination of information on all phases of modern foundry practice. Enormous demands for particular types of castings in both ferrous and nonferrous metals can be met only through the co-operative effort of the entire industry. With this thought in mind, the officers and staff of the American Foundrymen's Association have developed an exceptional program for the First Western Hemisphere Foundry Congress, the Ordnance and Defense Exhibits and the Foundry and Allied Industries Show.

At a meeting of the board of directors of the association in Chicago on Jan. 11, it was voted to eliminate the Saturday Preview Day for the exhibits, due to fact that the vast majority of foundries are working six or seven days. However, under present plans, foundry employes of Northeastern Ohio will be invited to visit the exhibit perhaps on Monday evening of convention week. Therefore, the Cleveland convention and exhibition will open on Monday, April 20, and extend through Friday, April 24.

With the co-operation of executive officers of the Cleveland ordnance district and the Cleveland Post of the Army Ordnance Association, a large section of the foundry show will be devoted to showing war equipment and materials and a display of the products of the foundry industry in the war effort. The purpose will be to show foundrymen what parts they can produce to further the war program. Equipment and supplies being developed to increase production will be featured by the foundry equipment and supply manufacturers. Other government departments will have exhibits stressing other phases of war efforts.

Many sessions of the First Western Hemisphere Foundry Congress will be the informal, round table type, where latest problems will be brought up and authorities best able to present answers will be on hand.

Engineering and metallurgical developments, as well as general interest problems of cost methods, plant protection, foreman and apprentice training, will be presented at the many technical sessions. Cast iron shrinkage theories and practices and sand control will be the subjects covered at the shop operation meetings, while core practices and theories will be stressed in the annual lecture course.

Each of the five divisions of the association, namely steel, malleable, nonferrous, gray iron and pattern making, will hold several sessions to discuss its particular problems, many of them bearing on developments due to war efforts and all having their place in improving casting production, processes and properties. Arrangements are being made to have a special speaker from the army, navy or other government departments each day of the convention.

Officers of the Northeastern Ohio Chapter which will be host to the First Western Hemisphere Foundry Congress and forty-sixth annual convention of the association, have appointed committees to care (*Please turn to page* 134)

Casting Guns CENTRIFUGALLY

THROUGHOUT the history of the development of the cannon, mobility—as well as fire power—has been a paramount consideration, just as it is today. The earliest cannon were single tubes of cast iron or bronze. As gunpowder improved, more and more metal was put into these guns until the mobility factor practically was destroyed. This forced a change to cast and then to forged steels which relieved the situation only temporarily. Competition among nations in hurling larger and larger projectiles to greater and greater distances employing ever-increasing powder charges dictated another change—the expediency of reinforcing the steel tubes by wrapping them with wire or by shrinking on forged jackets and hoops, or by both.

Arsenal Has Long History

The history of gun making is woven intimately with the history of the Watertown Arsenal, Watertown, Mass., which was 125 years old in 1941. As one unit in the system of manufacturing, procuring, and research facilities of the Ordnance Department of the United States Army, the Watertown Arsenal has a continuous record of noteworthy achievements. It was through the research of this unit that the change-over from cast iron to forged steel was effected. Due to the efforts of the Ordnance Department in general, and of that arsenal in particular, the United States today leads the world in the science of gun making. Furthermore, it leads the world in mass-production methods of gun manufacture.

This has come about through three developments pioneered at the arsenal which are not only revolutionary but are evolutionary as well. Together or separately they constitute the greatest advancement in gun making since the inventions of rifling and the breechblock and put America far in advance of any other country in this science. These three steps are: (1) the casting of cannon by the centrifugal process—superseding forging; (2) cold working by the autofrettage method, and (3) the creation of stronger and tougher gun steels.

While the Watertown Arsenal really was established in 1800 by President John Adams at Charlestown, Mass., it was moved to its present site at Watertown in 1816. That is the date from which the one hundred and twenty-fifth anniversary, celebrated last year, stems. This arsenal, therefore, has served the United States in every war since and including that of 1812. This plant primarily manufactures seacoast gun carriages of all types, railway and antiaircraft gun mounts and, due to its successful development of centrifugal casting, cold working, etc., it also has become a gun-making plant.

Brig. Gen. T. J. Rodman, who commanded the arsenal from 1859 to 1861, was responsible for the developments covering the progressive burning of gun powder, the design of seacoast gun carriages and the development of the water cooled chilling method for the bore of cast-iron cannon, thereby obtaining much the same effect as that sought by cold working today. Brig. Gen. T. C. Dickson, who commanded the arsenal from 1918 to 1933, is the officer more responsible than any one else for the development of the laboratory at Watertown, the development of centrifugal casting, cold working, and the welding of gun carriages.

Gun Making Is Speeded

Centrifugal casting has greatly speeded the making of guns, for a single casting machine will turn out several gun tubes in the time it takes to forge one, and subsequent machining is reduced materially. The new process of cold working so improves the physical characteristics that the time-honored built-up sections of separately forged jackets and hoops shrunk onto the tubes and each other have become obsolete; instead, there is a single tube that is superior in every way. This is known as the monobloc type of gun, the standard type of antiaircraft gun today. The elimination of forging these sections, shrinking them on, and the reduced amount of machining required constitute savings in time, labor, and material ranging from 25 to 40 per cent. The reduction in weight is

By
BRIG. GEN. R. W. CASE
Commandant
Watertown Arsenal,
Watertown, Mass.

Y AT WATERTOWN

This article, dealing with the contributions of Watertown Arsenal to progress in gun making, and the application of the centrifugal casting process in applying mass production methods in gun manufacture, originally appeared in the November-December, 1941, issue of ARMY-ORDNANCE, the Journal of the Army Ordnance Association. The article is reproduced by special permission of that publication

considerable and is used in many guns to regain mobility.

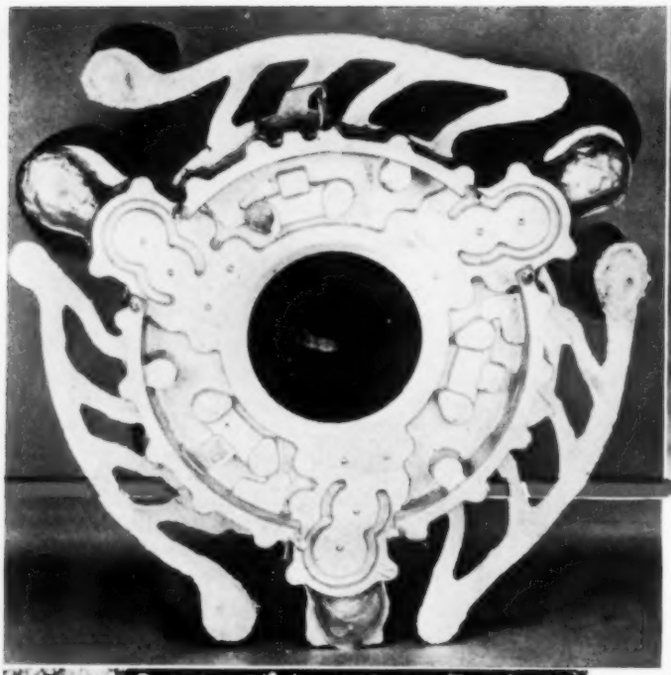
In the research laboratory at Watertown, many steels have been developed. Here were created the nickel steels so widely used in the automobile industry today; the molybdenum high-speed tool steel, a substitute for the tungsten high-speed tool steel and more lately the chromium-molybdenum-vanadium gun steels that are now used in making the guns. The guns cast here by the new process include the 37-millimeter, the 40-millimeter, the 90-millimeter, the 105-millimeter, and the new model 3-inch—in fact, everything from the 1.1-inch to the 4.5-inch, and preparations are being made to cast even larger sizes.

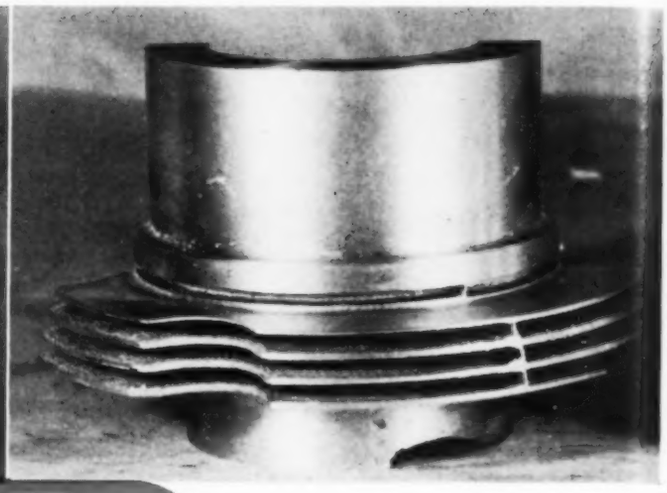
The idea of centrifugally casting thin-walled pipe or pouring molten metal into swiftly revolving tubular molds is very old. However, it took the personnel of the Watertown Arsenal many years of constant work to solve the myriad physical and metallurgical problems involved in adapting the method to the manufacture of guns. In the present building devoted to this work, platforms are located at both ends to hold the electric melting furnaces, which are of the coreless induction, high-frequency type. There are several production lines with casting machines, a large cinder bed in the center for cooling the guns, and a row of furnaces on one side in which the guns are normalized. The melting furnaces range in size as to hold exactly the amount of steel needed for each size and type of gun when pouring.

The molding machine is a long horizontal cast tube, weighing from five to ten tons, which is rotated at a high rate of speed by a motor. Into this is fitted any one of several tubes or molds, bored out to the exact exterior dimensions of the type of gun to be cast, due allowance being made for shrinkage, cold working, etc. These molds weigh from three to four tons each. In front of the machine is a track with a tipping car on it.

When the metal is melted, the entire furnace is picked up by one of several overhead cranes and is placed in this tipping car. A pouring box with a nipple is then placed between the furnace and the closed end of the casting machine with the nipple protruding through an opening in the cover of the casting tube. The molten metal is then poured into the (*Please turn to page* 154)

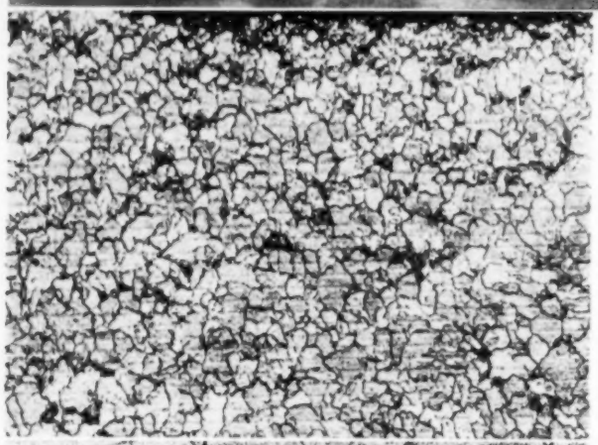
Above—Official photograph U. S. Army Air Corps.
Below—Part of centrifugal castings plant at Watertown

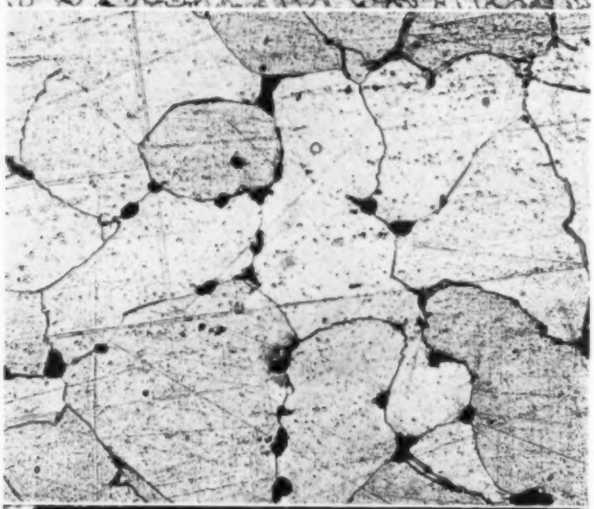


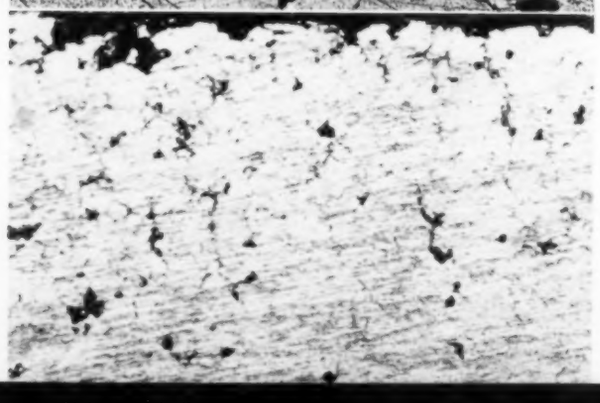


Porosity in ALUMINUM CASTINGS

By WILLIAM WILSON JR.
Foundry Superintendent
Eclipse Aviation Division
Bendix Aviation Corp., Bendix, N. J.







IT IS well known that most castings scrapped in the foundry, before or during rough inspection, are discarded because of sand holes, missruns, shifts, crushes, or other easily recognized causes. Often, however, it is not until castings have been cleaned and sandblasted and are ready for final inspection (or even, in some cases, not until after machining) that still other defects, not apparent before, become noticeable. Scrapping at this time is almost always due to porosity, a term which seems to cover all defects which pass the first visual examination.

Causes and elimination of porosity are not understood clearly. Many foundrymen confronted with a porous casting can only venture a guess as to the reason for or solution of the problem. The subject invariably crops up at foundry meetings where the resulting discussion plainly shows a very definite absence of facts.

Copyright 1942, Bendix Aviation Corp.

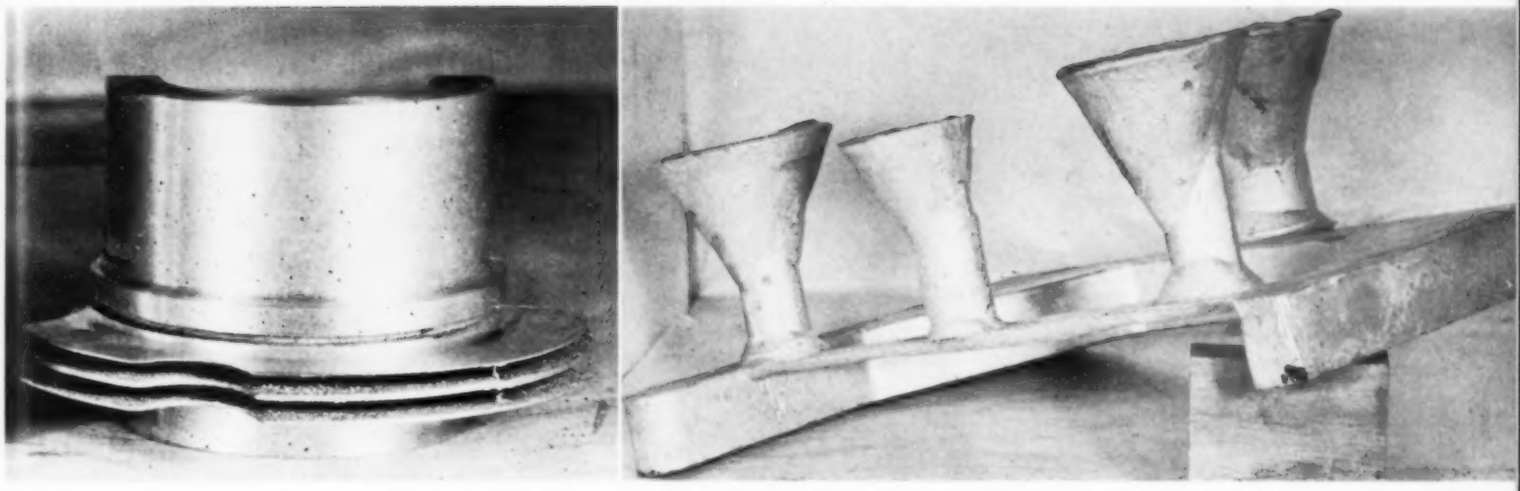


Fig. 1 (Upper extreme left)—Casting showing use of numerous gates. Fig. 2 (Upper left center)—Micrograph of porous section. Dark spots caused by insufficient feed. 10 diameters. Fig. 3 (Lower left center)—Same section at 100 diameters. Dark lines are copper constituent. Round spots are porosity. Fig. 4 (Left bottom)—Same section after etching to cover grain constituent and bring out porosity and shrinkage. Fig. 5 (Left above)—Casting at left has no porosity while one at right has porosity from gas absorption. Fig. 6 (Right above)—Improper gating. Discoloration at right caused by impingement and drop of metal. Fig. 7 (Right below)—Cores are vented to permit escape of gas

The main difficulty in discussing porosity in aluminum castings seems to be the false assumption that there is only one cause of this condition. Through our experience we have come to the conclusion that there are many causes. These seem to fall into four distinct classes: 1. Metal; 2. Gating; 3. Trapped air and gas, and 4. Shrinkage.

By classifying the various types, we have found it easier to recognize the cause of the porosity and thus to take the proper steps to eliminate it. For instance, if upon examination, a casting's porosity is classified as resulting from improper gating, the various elements in the gating can be checked in order to correct the trouble, at the same time leaving all the elements in the other three classes unchanged. Without this classification, it often happens that all the elements throughout the foundry are changed, and although the porosity may be eliminated the reason for it still remains unknown.

Porosity Caused By Metal

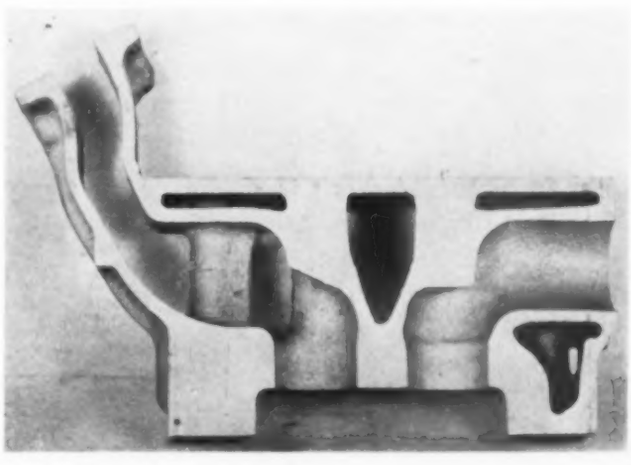
The first type of porosity, caused by the metal itself, is easily identified because the casting is noticeably porous throughout. Any section, when examined by magnifying glass or other means, shows thousands of salt and pepper spots scattered over the entire surface as shown in Fig. 5.

That porosity is caused by gas absorbed in the metal during melting, and by any of the improper melting processes such as: Too quick heating; disturbance resulting from dropping cold metal into liquid metal; melted surface exposed before pouring; improper stirring, fluxing and skimming; and disturbance resulting from dropping metal from the melting pot into the crucible and from the crucible into the mold.

In different metals, such porosity will vary with the chemical composition. An alloy having 5 per cent silicon, 1 per cent copper, ½ per cent magnesium and the remainder aluminum, will pick up porosity more readily than one composed of 95 per cent aluminum and 5 per cent silicon.

To eliminate porosity in the metal, whether there is 1 per cent or 10 per cent magnesium or none at all, the following procedure has been found effective: Use a cleaned pot, one free of any oxide. Coat with a film of lime wash and dry. Charge the furnace with small pieces of gates and risers and load the remainder of the metal, whether pig or ingot, in such a way that that metal does not bridge. Do not heat the pot to more than a deep cherry red and check to be sure the color is even all around the pot.

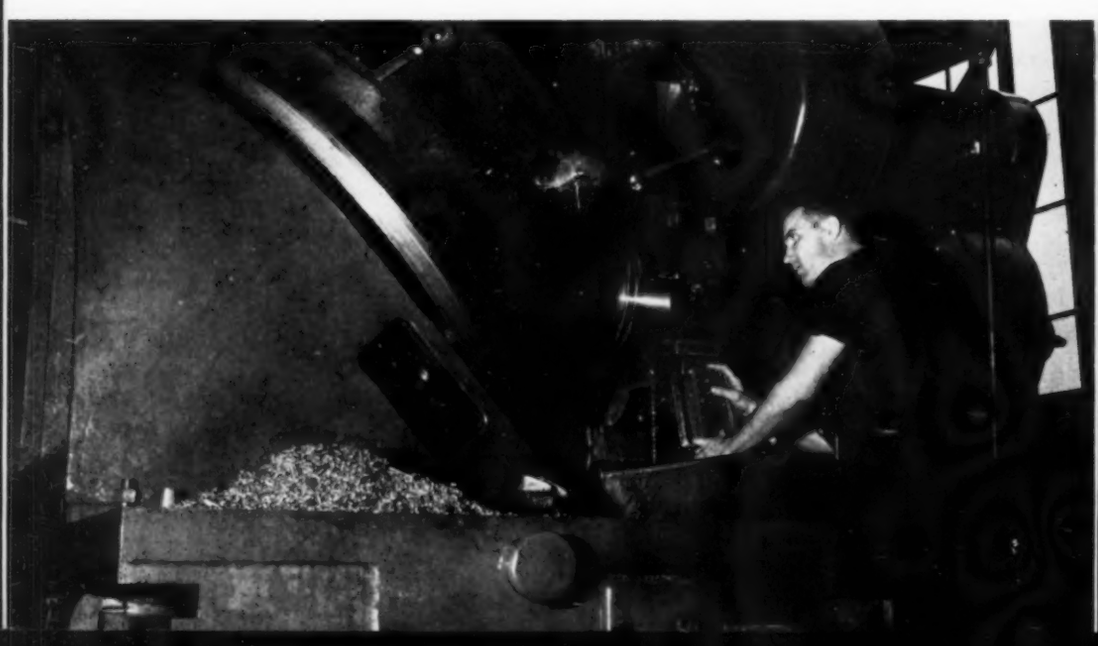
When the last of the solid metal becomes molten, form a cover (*Please turn to page* 151)

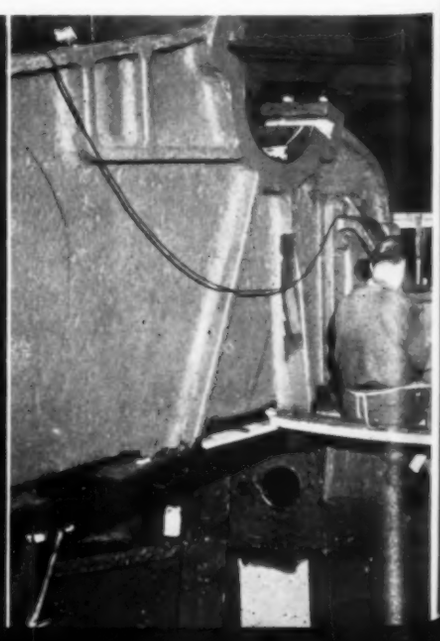


Foundries Gird to Meet WAR DEMANDS

COMMENTS of many leaders of the foundry industry indicate the progress of the past few years will be of immense value in the manufacture of castings to meet war demands. Developments of the national defense period will provide the starting point for the pyramiding of castings production as the industry continues normal government demands, as was established during the past year, and at the same time increases the output of war work by undertaking to make of castings products formerly produced by other methods of fabrication. One of the pressing problems for the industry pertains to the co-ordination and simplification of specifications in order that foundries may provide maximum service to the nation and its armed services in this emergency.

The comments presented in this issue, and those to be included in March, originally were prepared at the request of the editors of *Steel* for presentation in the Yearbook of Industry of that publication. Because of the widespread interest in past and future trends within the industry, as gaged by the men in the plant and the laboratory, the comments are presented in THE FOUNDRY.





Cast Steel Armor Plate Development To Dispel Old Prejudices

By JOHN HOWE HALL
Consultant
Philadelphia

UNDOUBTEDLY the outstanding development in the steel foundry industry during the past year has been in the production of cast armor parts of intricate shape and increased size. It is, of course, impossible to give any details of this progress under present circumstances. However, it is not too much to say that the experience gained by the industry and its customers in making these parts will have a profound effect upon molding and heat treatment practice in the manufacture of steel castings after the present emergency has passed. In particular, existing prejudices against heat treatments designed to enhance greatly strength and shock toughness of steel castings will have been largely dispelled. The cult for restricting the heat treatment of large castings to an old-fashioned full anneal is doomed to speedy extinction.

In this connection it is apropos to remark that while in certain quarters a sympathetic attitude has been encountered, still it must be said that progress in eliminating undesirable restrictive clauses in certain government specifications for steel castings has been disappointingly slow. In particular, sections of these specifications instructing the foundryman in how he shall make and heat treat his castings rather than what tests his finished products shall meet, have been clung to with disturbing pertinacity.

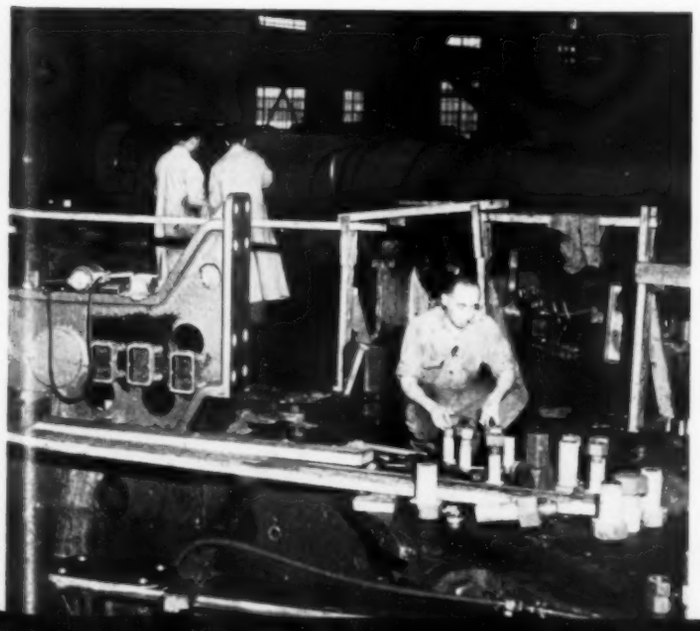
Nondestructive methods of testing steel castings have made further progress. Large, high-powered x-ray installations are being made in several shops greatly speeding up radiographic examination and widening the range of castings to which radiography can be applied. A new technique in magnetic powder testing, which improves the usefulness of the method, and promises to eliminate some of its undesirable features, is under development.

As more reliably weldable cast steels have been developed, the trend toward the substitution of welded all-structural parts for steel castings has been arrested. In place of the often costly and wasteful method of building up a unit from a multiplicity of small pieces of rolled or forged steel, the welding together of several steel castings, or of castings and rolled or forged products, has made further progress.

The scarcity of some alloys has resulted in the substitution of other compositions, which, by appropriate heat treatments, are made to exhibit properties equal to or better than those of the older alloy steels.

The old problem of sand adherence and penetration of steel into cores, has come in for attention in a number of quarters, and various measures to minimize this enemy of the foundryman are being tried out. The need for an organized attack on this problem by the whole industry becomes more apparent every year.

Upper left—Production of quality steel requires careful control. Lower left—Machining the bottom ring of a cast steel turret for a tank. Below—Assembling the large castings which form the mounting for a big barbette gun. OEM Defense Photos by Palmer



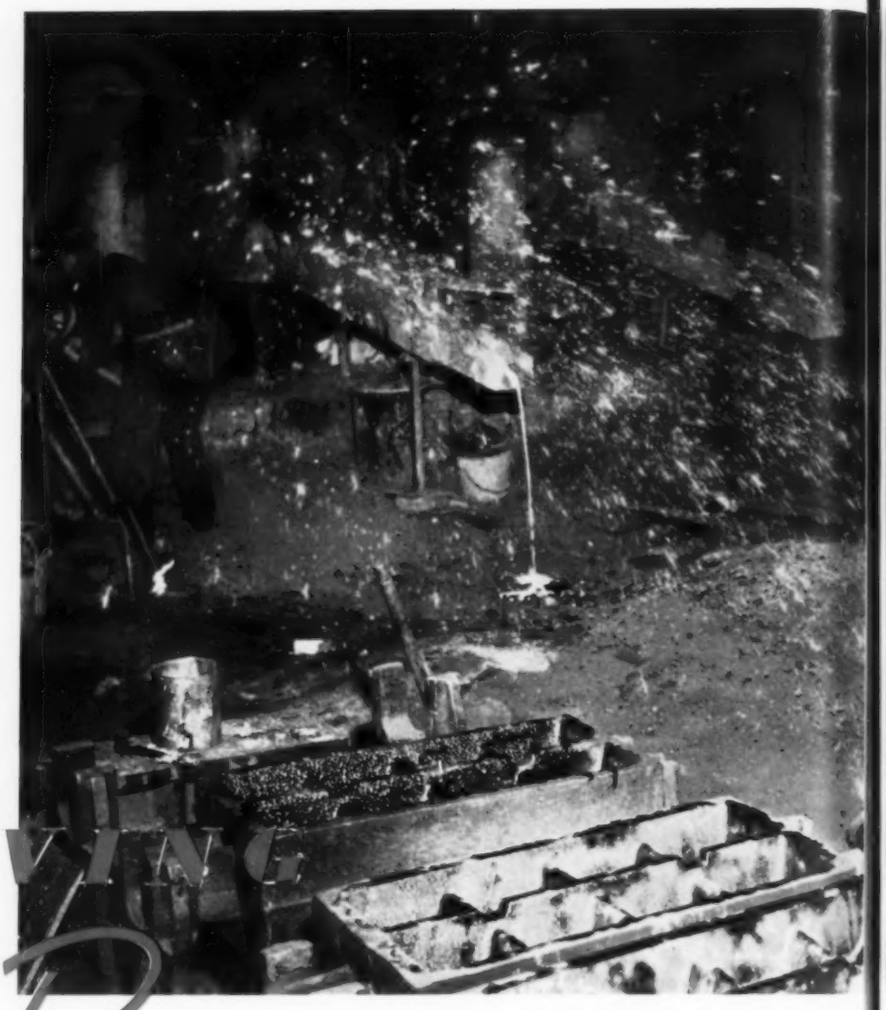
Lack of Training Creates Problems In Shift to War Work

By N. K. B. PATCH
Secretary
Lumen Bearing Co., Buffalo

THE outstanding problem of the nonferrous castings industry today obviously is the problem of getting the requisite raw materials when they are needed and in sufficient quantities to insure continuous production at all times. War conditions control this problem so completely that one is constantly faced with doubt as to sufficient renewal of inventory for next month's production.

Another problem deals with the requirements of foundries that previously have been specialists in consumer goods having little or no application to war work. These plants have had to take on the production of castings for war in order to keep their men from being out of work. Therefore they have been confronted with the problem of making types of castings that are new to them. Consequently the problems incident to production must be learned from scratch. This has produced a definite problem for many foundrymen of the smaller shop who have been specialists in some line that they have found

(*Continued on page* 145)



IMPROVING Cupola Performance

By DON J. REESE
International Nickel Co., New York

OUR defense efforts demand that we apply all the principles of conservation of raw materials known to us, and melting operations can do a lot in making our limited supply of coke, steel scrap and silicon go further than ordinarily is the case. Records of one foundry with which the author is familiar, indicate these possibilities.

Three years ago the foundry used about 234 pounds of coke per ton of melt, the following year 204 and last year 170. The difference of 34 pounds of coke per melt over the past two years, on the basis of 30,000 tons of melt per year amounts to quite a lot of coke—500 tons per year less for 1941 versus 1940's operations, or about 1000 tons per year better than 1939's operations. That means saving one ton of coke for every 60 tons of melt and as the foundry used to illustrate the point has always done a good job, most of us could do as well and some of us could do a lot better. Assuming the industry is melting about 15,000,000 tons, conserving 1 ton of coke in every 60 tons of melt would be an appreciable figure.

Today, most foundries use 10 to 90 per cent steel in the cupola charge. Failure to employ good operating principles means that there is little relationship between the carbon content of the charge, and the carbon content of the product versus a definite relationship when good operating principles apply. It is the author's opinion that the industry as a whole uses twice or more than twice as much steel scrap as would be necessary to attain the quality levels desired in the product.

Assuming that the industry is melting 15,000,-

OEM Defense Photo by Palmer

000 tons and that the average cupola charge would contain 30 per cent steel, this rough figure amounts to 4½ million tons of steel scrap. The author believes that 2¼ million top would do an equivalent job in quality control, provided good operating principles were employed. We could use 2¼ million tons to up the level of production or let it go to the steel industry. However, that does not mean to imply that each ton of steel eliminated would not have to be replaced by an equal amount of cast iron scrap. Nor does it mean that all efforts to conserve steel scrap would be 100 per cent effective as there are problems of getting materials transported to the place where they will do the most good, etc.

When we use steel in the cupola charge, we have to replace its silicon deficiency with silicon additions, using about 40 pounds of silicon per ton of steel used. If we could conserve 1,000,000 tons of steel, we could conserve 40,000,000 pounds of silicon.

A little while ago, some figures were quoted on fuel consumption for a foundry melting 30,000 tons per year—and reduced these figures to tons of coke conserved. In round figures they also have conserved 2000 tons of steel scrap and 60,000 pounds of silicon.

The steel industry produced approximately 83,000,000 tons of steel in 1941, and we hear figures of 120,000,000 tons required for 1942. The author does not know how much additional tonnage is going to come out of the steel industry, but he does know that both the steel industry and the foundry industry need coke, steel scrap and silicon and that we both get our raw materials from the same limited supply. Why not do now what we will have to do sooner or later and make our contributions to our country's welfare most effective.

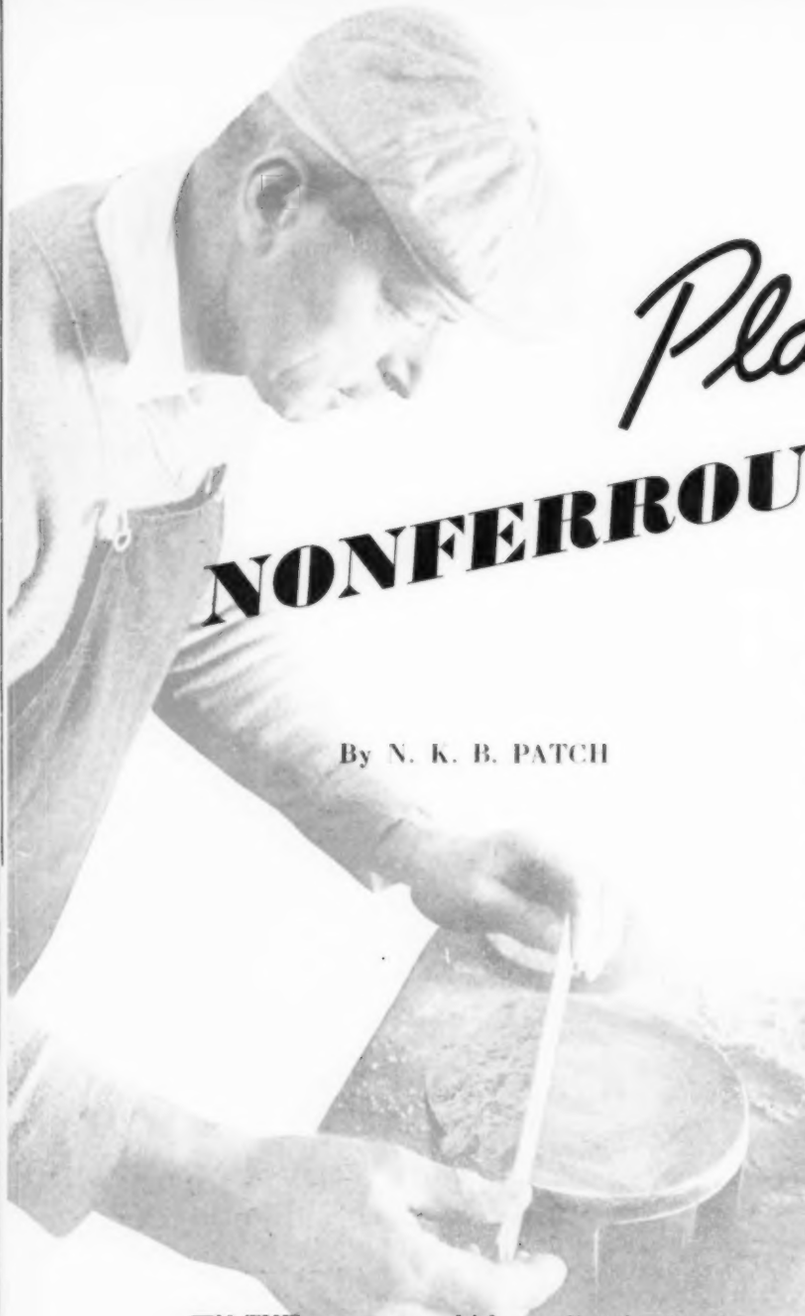
Briquet Machine Shop Borings

What else can we do? If you machine your own castings, or if your foundry is part of a manufacturing plant, you are producing scrap such as steel turnings, cast iron borings, steel scrap in the structural shop, flashings and crop ends in the forge shop, etc. One prominent southern foundry is installing a briqueting machine, to briquet cast iron borings and the total investment is said to be about $13,000. You may not have $13,000 to spend for a briqueting machine or have sufficient tonnage of borings to warrant such an expenditure. However, it might be possible for three or four foundrymen to share the expense or it may be possible that your customer, who machines your castings, could install a briqueting machine and sell you briquets. One foundry making automotive brake drums uses 60 per cent briquets in the cupola charge.

The chances are almost perfect that you can use all structural, forge and machine shop scrap provided it is suitably mixed. What about the other industries in your locality? If they are metal working industries, they produce scrap and it would be more economical for you to use it than for them to ship it to some distance while your requirements also come from some distance.

One foundry made a cemented briquet of 18 pounds of borings and 2 pounds of quick setting cement, leaving these briquets air dry for three days and then using up to 10 per cent in a charge. Another foundry used 100 tons of heavy steel turnings in the cupola, shoveled in loosely, as an experiment during 1939. The author believes much more is being used today.

At the end of the day's run, it seems quite possible that you could break up your coke to 1½ or 2 inches so that you have a very small coke and melt loose borings, shoveled into the cupola. Several foundrymen have been asked to try it, using 1000 (*Please turn to page* 140)



Planning the NONFERROUS FOUNDRY

By N. K. B. PATCH

IN THE core room which supplies the foundry with the necessary cores obviously the construction of the room and its equipment influences greatly the efficiency with which the whole plant may be operated. If the plant is to produce large castings requiring quantities of relatively large cores, then the amount of room necessary and the type of equipment for the production of these large cores must be borne in mind in the designing of the plant.

Furthermore, the location of the core room with respect to the foundry floors is an important matter to consider in laying down the plan of the entire foundry. If the cores are going to be small but in large numbers as for example in the production of plumbing supply equipment, or small bearings and bushings, the oven equipment, the core machine equipment is of course quite different from that where cores are going to form the major part of the molds and they are of massive design requiring large ovens in which to dry them and equipment capable of moving these heavy cores in and out of the ovens.

In other words, to plan an efficient core room that will supply a given foundry, the first consideration is what type of work is the foundry to produce. The second is where in the foundry is this work to be produced, and therefore where will be the most convenient place to locate the core room.

Next, in planning this core room ample light must be provided as well as ample ventilation. The fumes from drying cores and the waste heat from opening and closing of core oven doors both influence the comfortable working conditions for the employes in this department and to secure maximum production the employes must be comfortable and their surroundings must be healthy so that they may not lose any more time than is absolutely necessary by reason of ill health.

Various Types of Floors Available

There are a number of floors that have given satisfaction in the core room. Most core rooms are so laid out that all traffic is more or less confined to certain limited parts or areas of the floor space. These aisles or traffic ways should be provided with floors that will withstand the abrasive effect of the fine grit that accumulates thereon in spite of the frequent sweeping that such departments should receive regularly.

Therefore, a hard finished concrete is one satisfactory type of floor. A floor made of high grade paving brick is also very satisfactory and either of these will require a minimum amount of repair. A good tightly laid hardwood floor will serve very well but it will need repairs from time to time that while the first cost may be less when the repairs are taken into account such floors become more expensive than either of the two former types.

Ventilation of core (*Please turn to page* 137)

Interesting Technique Used on Large MOTOR FRAME

By R. L. HARTFORD
Pittsburgh Editor, The Foundry

INTERESTING technique was used in recent production of a large dual ventilated motor frame casting at Trafford Foundry, Westinghouse Electric & Mfg. Co., Trafford, Pa. Eleven thousand pounds of gray iron were poured on this job, which ran 8400 pounds finished.

The frame was cast in a flask of four sections which was seven feet square on the base, consisted of a cope, a drag and two cheeks, each two feet high, and was end poured. The two cheeks were rammed together, then one was drawn off and the pattern was removed. The two were then locked together and dried.

Core technique was interesting in that 80 individual port cores were used. A large barrel core formed the center, around which the port cores were assembled. All cores were hand rammed of oil sand, and the final assembly was skin dried overnight with a gas flame.

The barrel core was made in two halves with cast arbors and steel reinforcing rods inside. When dry, the two halves were cemented together and bolted. Port cores, made separately, were then cemented and wired to the barrel core. Each of the 80 port cores was spaced evenly and all vents were connected to vents in the barrel core, which was vented through the cope.

Three hundred and twenty perforated metal chaplets, (*Please turn to page* 136)

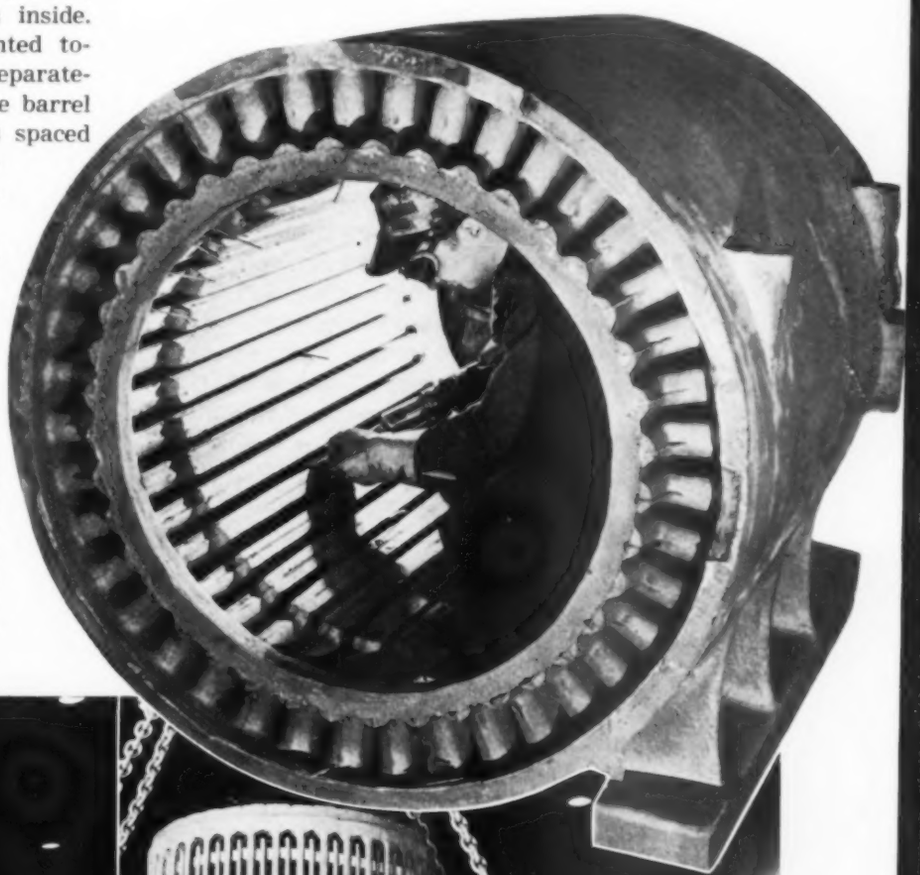
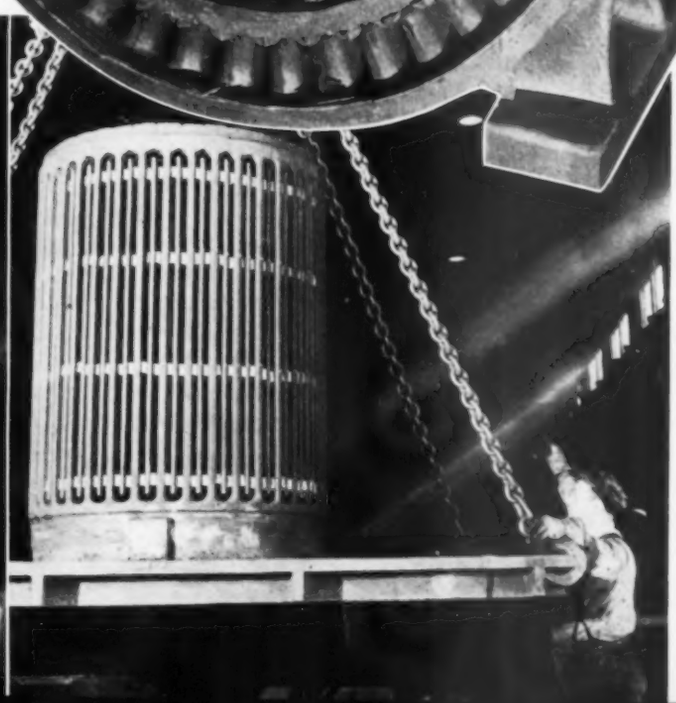


Fig. 1 (Below)—Barrel core was made in two sections then bolted and cemented together. The view shows the barrel with the first 4 port cores in place, located 90 degrees apart. Three are visible here. Fig. 2 (Right)—Chipping the finished casting. A good idea of the size is obtained by comparison with the workman inside. Fig. 3 (Lower right)—Completed core assembly. Note the port cores of which 40 are anchored to the inner ring and 40 to the outer ring. The 4 rows of chaplets, used to hold the port cores during pouring, are also visible



QUESTIONS and ANSWERS

Describes Procedure To Obtain Smooth Casting Surface

We are interested in obtaining a smooth casting in sand. We repair a large volume of silverware and regularly have to make such parts as legs, knobs, handles, spouts, etc. We have been making these in plaster parts, but have switched from this to sand. We are anxious to get a sand that would make smoother castings in brittania, also would like to make some of these castings in brass.

The fact that you are doing repair work would indicate that you never have to make very many castings from a given pattern, and it becomes more a question of smoothness to save labor on finishing the casting than the question of saving labor for molding. Consequently, the method that will produce the smoothest casting that is nearest to the desired design even though it does require extra molding time usually will be the cheapest in the long run.

In our opinion the plaster of paris mold would yield the best finished casting if it is properly done and would probably be the most economical in the long run. You have no doubt found that these plaster paris molds must be hot enough to be relatively free from moisture when the castings are poured. If such molds are well prepared and taken from a core oven, for example at a temperature of 150 to 200 degrees Fahr. or even up to 225 degrees, you can pour brass into them just as well as you can brittania metal and get castings that are very highly finished and accurate to pattern. The preparation of the mold of course is much more expensive than a sand mold but the labor on the castings thereafter is much less.

For the highly finished sand mold such as statuary work etc. French sand is used. This is not being imported today due to the war conditions. There may be some sand dealers who have some in stock who could supply you. A reference to the advertising pages of THE FOUNDRY will refer you to a number of sand dealers.

Another method of producing fine sand for this highly finished work is to sift Albany sand after it has been dried so that it can be rubbed or mulled to produce the individual sand grains free to pass through very fine sieves. By taking some of this very fine sand produced by careful sieving and mixing it with a desired amount of bond or moisture a facing sand can be provided which may be spread over the pattern to form the surface of the mold.

Some find that to make this facing sand with finely sifted sand plus molasses water or other such bond gives them a mold that meets requirements but others prefer to use a thin solution of fireclay and water and others prefer to use some other type of bond such as dextrose dissolved in water. It should be borne in mind that such molds must be dried thoroughly to evaporate the moisture from the surface in order to permit the hot metal to lie quietly.

Has Trouble Melting Clippings To Make Gray Cast Iron

In our school foundry we have a 24-inch diameter cupola, a 250-pound electric arc furnace and a 300-pound capacity induction furnace. Recently we melted a steel charge in the induction furnace with the intention of converting the steel into gray iron. The steel was practice pieces, thin sheet steel and small pieces of wrought iron pipe, supplied by the welding shop. These practice pieces contain closely spaced weld and brazed seams. The graphite crucible was charged with alternate layers of small coke and steel scrap. At a certain stage of the melting process the metal commenced to boil. The boiling action rapidly increased in violence and threw most of the metal out of the crucible. Do you think a heavy layer of white beach sand converted to slag on the top would have prevented this action and loss of metal?

Even had your experiment succeeded to the extent of melting the metal, the result would not be gray iron. Low carbon steel contains carbon under 0.20 per cent, practically no silicon or manganese, with phosphorus and sulphur under 0.05 per cent. Average gray iron contains carbon over 3.00 per cent, silicon over 2.00 per cent, manganese 0.50 per cent, phosphorus 0.50 per cent and sulphur up to 0.10 per cent. Molten steel will pick up carbon from coke, but the other elements in proper proportion must be added artificially either in the furnace or in the ladle. Touching on the boiling metal, you had an exaggerated sample of what is known among steel melters as a *wild heat*, that is a heat in which the metal is impregnated with gas. In your particular case the gas probably was evolved from the metal and slag in the brazed and welded seams in the scrap. This was intensified by the type of furnace employed in which the current

flows through the charge and causes the metal to circulate. Incidentally a graphite crucible is not suitable for melting steel. Graphite is carbon, and steel has a great affinity for carbon. Clay crucibles are employed in the steel industry. We suggest a study of a work entitled "Elementary Foundry Technology," available through THE FOUNDRY.

Matchplate for Wing Nuts Is Not Sufficiently Accurate

We are forwarding a small wing nut to show you the manner in which a fin appears at each side of the ear into which it is gated. The castings are poured in sand molds from two matchplates. We have checked the plates carefully and are sure they are not responsible for the fins. Do you think it is feasible or practical to make these castings in permanent molds?

Presumably the patterns are arranged on the plate in a double row with a long runner in the cope. A runner in the drag would serve satisfactorily since the castings are small and do not require any feeding. However, the runner in the cope is preferable since it will act as a dirt catcher. Whether the runner is in the cope or drag, it is responsible for the fins at the gate end of the casting. The metal pressure along this area lifts the cope sand to a slight extent and the molten metal enters the opening to form the fin. The remedy is to file or scrape away a paper thickness of metal from the plate at this point. This will provide a stronger *touch* at this point and will prevent the formation of a fin. We do not think a permanent mold for these castings would present any advantage over your present method either in volume or quality of the product. The permanent mold is feasible, but in this particular case is not practical. We are inclined to the opinion that you would have more missruns than good castings.

Desires To Operate a Cupola Without Use of Coke

Have you any information on what experimentation has been done in an effort to develop a satisfactory cokeless cupola for melting iron? One of our men has some ideas on the subject and we want to show him what has been done by others.

We have seen so many developments in the foundry in recent years that we hesitate in condemning any proposed process simply because we are not familiar with it. However, so many useless attempts have been made to run a cupola on gas or oil, that we are inclined to the opinion that your man is wasting his time. Description of attempts and casual reference to the subject have appeared in foundry literature on many occasions, but they are so scattered that even an experienced investigator might spend months on the trail. The best hunting grounds are among the back volumes of THE FOUNDRY and the *Transactions* of the American Foundrymen's Association.

An illuminating comment is presented in Chapter X, *Principles of Iron Founding*, by the late Dr. Moldenke. The subject also is touched upon in *Melting Iron in The Cupola* by J. E. Hurst. The May, 1941 issue of THE FOUNDRY, page 146 carried a brief item from a foreign publication referring to the work of Russian professors in operating an oil fired cupola. We have no way of checking on the accuracy of the report. While the method may be within the bounds of possibility we do not think it is either practical or economical. Melting metal in that manner might prove an interesting laboratory experiment, but it is not applicable to ordinary commercial practice. So far as we know up to the present no method of melting iron for foundry use has approached the ordinary coke fired cupola.

Cast Iron Gear Wheel Cracks Through Web and Arms

We have trouble with a cast iron gear blank 62 inches outside diameter, 12 inch face, web center 1¼ inches thick with six ribs same thickness equally spaced top and bottom. An opening 7 inches diameter and on a 42-inch diameter center line is located in the web between each pair of ribs. Metal in the rim and hub is 3½ inches thick. The hub core is 9½ inches diameter and the metal is thickened on two outside areas 90 degrees apart to compensate for the keyways. The casting weighs approximately 3800 pounds and is poured from a mixture containing 40 per cent steel scrap, 0.40 per cent chromium, 0.50 per cent molybdenum and 2.00 per cent nickel. Analysis of the casting shows 1.41 per cent silicon, 0.96 per cent manganese, and 0.27 per cent phosphorus. We have tried different gating methods, have stripped the rim and dug out the center core, but the casting cracks through the web and arms.

You are up against one of the curses of the foundry industry, a casting designed in defiance of the laws of shrinkage and contraction. The thin web sets before the heavy rim and hub. When their turn comes it is a case of pull dog, pull devil and the metal pulls apart at the weakest point. The openings in the web accelerate the cooling speed of the web and also act as ideal starting points for the metal to crack. Here is where a leaf may be borrowed from the steel foundryman's book. Provision should be made for equalizing so far as possible, the temperature of the metal in all parts of the casting.

The outside of the rim is faced with a number of castings, either plain slabs, or with a radiating rib at the back. Four of these light chillers can be set up against the face opposite each of the six arms. Of course, many other methods of cooling the outside of the rim are available, but the foregoing probably is the most efficient and convenient. These plates do not actually chill the metal in the ordinarily accepted foundry sense and therefore, do not interfere with the machining operation. The hub is cooled rapidly by digging out the core as soon as possible after the metal has set. The best way to gate the casting is through six ½ x 3-inch pop gates, one on top of each arm about the center. A circular basin is built on the cope to serve these gates. The object is to distribute the metal rapidly and uniformly, but principally to supply the hottest iron where it is needed most, that is in the thin web. Silicon might be raised 20 or 25 points.

Rub Wax Coating on Iron Patterns

We shall appreciate information on the subject of bayberry wax in its application to metal patterns. 1—Proper use of bayberry wax. 2—How to dissolve it. 3—Application to metal patterns. 4—Solution used.

Bayberry wax is a vegetable product secured from quite a wide variety of trees and shrubs including the wax myrtle. In the foundry the wax is used to coat iron patterns to prevent the sand from adhering and also to prevent the patterns from rusting. Alternative materials for the same purpose include beeswax, parafine wax and tallow. Items 2 and 4 do not apply to bayberry wax or beeswax. Either of these is melted in any convenient pot or pan. They are not mixed with any solvent. The warm liquid wax is applied to the surface of the pattern with a rag, a handful of waste or a brush. When the wax cools it is polished with a brush.

Gives Temperature For Pouring

Please tell us the best temperature to pour 88-10-2 and 88-8-4 alloys.

Pouring temperature for any copber-base alloy must vary necessarily with the type of work being poured. Obviously, thin walled castings must be poured at a higher temperature than those of a thicker section. Consequently, we can only give you a range within which to pour these compositions. They are so similar to one another that the temperature is almost identical for both. However, the 88-8-4 may require a little higher temperature; not more than 25 to 50 degrees Fahr. than the 88-10-2. This is explained by the fact that an increase in zinc in the 88-8-4 makes the composition a little more sluggish. Furthermore, the increased zinc requires larger and higher risers to insure proper feeding.

The range for these compositions is from 2050 to 2150 degrees Fahr. for normal work with an increase of maybe 50 or 75 degrees Fahr. more under extreme conditions. It should be pointed out that pyrometers require careful maintenance and adjustment to maintain accuracy, and do not put too much reliance upon the accuracy of your pyrometer without making regular periodic tests. After you have had experience in pouring these compositions with careful pyrometer control you will rapidly acquire a knowledge of how the metal looks after being skimmed at different temperatures and this experience coupled with the use of good pyrometers will enable you to maintain a very accurate control of temperatures for pouring.

Without this experience, inaccuracies in your pyrometer will not be recognized and you may be pouring the temperatures below or at variance with the true temperature because the pyrometer has gone out of adjustment. It should also be pointed out that the proper pouring temperatures of any composition is influenced by the type of gates and the number of them, which of course makes it possible to pour a casting with varying temperature in proportion to the rapidity with which the mold may be filled and consequently the time during which pouring takes place.

If a mold may be filled rapidly because of good gating it may be possible to pour the mold at a little lower temperature and get satisfactory results, whereas if the gates are such that the filling of the mold is retarded by inadequate openings then the metal must be more fluid or at a higher temperature to fill the mold rapidly. It will be seen from this that the relationship between pouring temperature and type of casting and method of gating is a very definite one and should be carefully studied if the best results are to be obtained.

Wants Information On Porosity

Can you give us any information on the causes of porosity which appears in the form of pin holes?

Pin hole porosity in nonferrous castings may arise from several causes, but generally the most prevalent is absorption of gases during melting. Other possible causes are improper gating, moisture content of the mold, lack of permeability in the mold, lack of proper feed, particularly where heavy and light sections adjoin. Porosity due to gas absorption usually is indicated by small holes or interstices through the casting. In the interior they are so small as to require observation with a strong magnifying glass for detection—and increase in size as they approach the surface. Porosity from other causes mentioned generally is confined to local areas.

Remedy for gas porosity is to check carefully the melting conditions to see that combustion is as nearly complete as possible. See that the alloy being melted does not extend above the top of the pot when placed in the furnace. Melting should be as rapid as possible, and when the metal reaches the desired temperature, it should be removed from the furnace and poured. Elimination of porosity from other causes requires first to find the culprit, and then apply the proper remedy.

Develops a Bridge In the Cupola

We are melting from 35 to 40 tons of iron daily between 11.15 a.m. and 4.50 p.m. in a cupola lined to 45 inches. A positive pressure blower running at 47 revolutions per minute delivers 25 cubic feet of air per revolution. The bed extends 46 inches above the tuyeres and the charges are made up of 400 pounds pig iron, 800 pounds selected scrap, 140 pounds coke and 40 pounds limestone, with a double charge of limestone on the bed. Volume and color of slag are satisfactory. Charge soaks for an hour before blast is put on. Iron is hot all through the heat ranging from 2740 to 2790 degrees Fahr. Analysis is approximately: Silicon 2.30 per cent, sulphur 0.10 per cent, phosphorus 0.65 per cent, manganese 0.70 per cent, total carbon 2.30 to 2.50 per cent. Instead of a clean drop after the heat, we find a bridge about a foot wide around the inside of the cupola above the tuyeres.

With the exceptions of two items everything conforms to excellent melting practice. A cupola melting between 6.27 and 7.16 tons of iron per hour requires between 3192 and 3646 cubic feet of air per minute assuming that 1 pound of coke requires 131 cubic feet of air. According to your statement your blower delivers only 1175 cubic feet per minute, or just about enough to melt 2.3 tons per hour. The iron charge is 400 pounds of pig iron and 800 pounds good cast iron scrap and yet you state the total carbon ranges from 2.30 to 2.50 per cent! Unless these air volume and total carbon figures represent typographical errors, we cannot reconcile them with any cupola practice with which we are familiar. Also we are at a loss to understand how the cupola can deliver iron at a high temperature and presumably at a maximum volume of 7.16 tons per hour all through the heat with a bridge 1 foot wide cutting off over half of the melting area above the tuyeres. Ignoring these anachronisms on the assumption that they do not really represent your actual practice, several causes are responsible for bridge formation in a cupola. The principal cause is high ash content coke which requires more than the usual amount of fluxing material. The second is low grade limestone and the third is high blast. If your figures are correct, the present blast of 10 ounces is not high. Analysis of the coke and limestone will show whether one or both are responsible. If you have no choice in the selection of these materials, a small amount of fluorspar (10 or 15 pounds) on each charge will promote the flow of slag and keep the cupola clean.

ALLOYS

Timely information about metals... CATALOGUED for your convenience

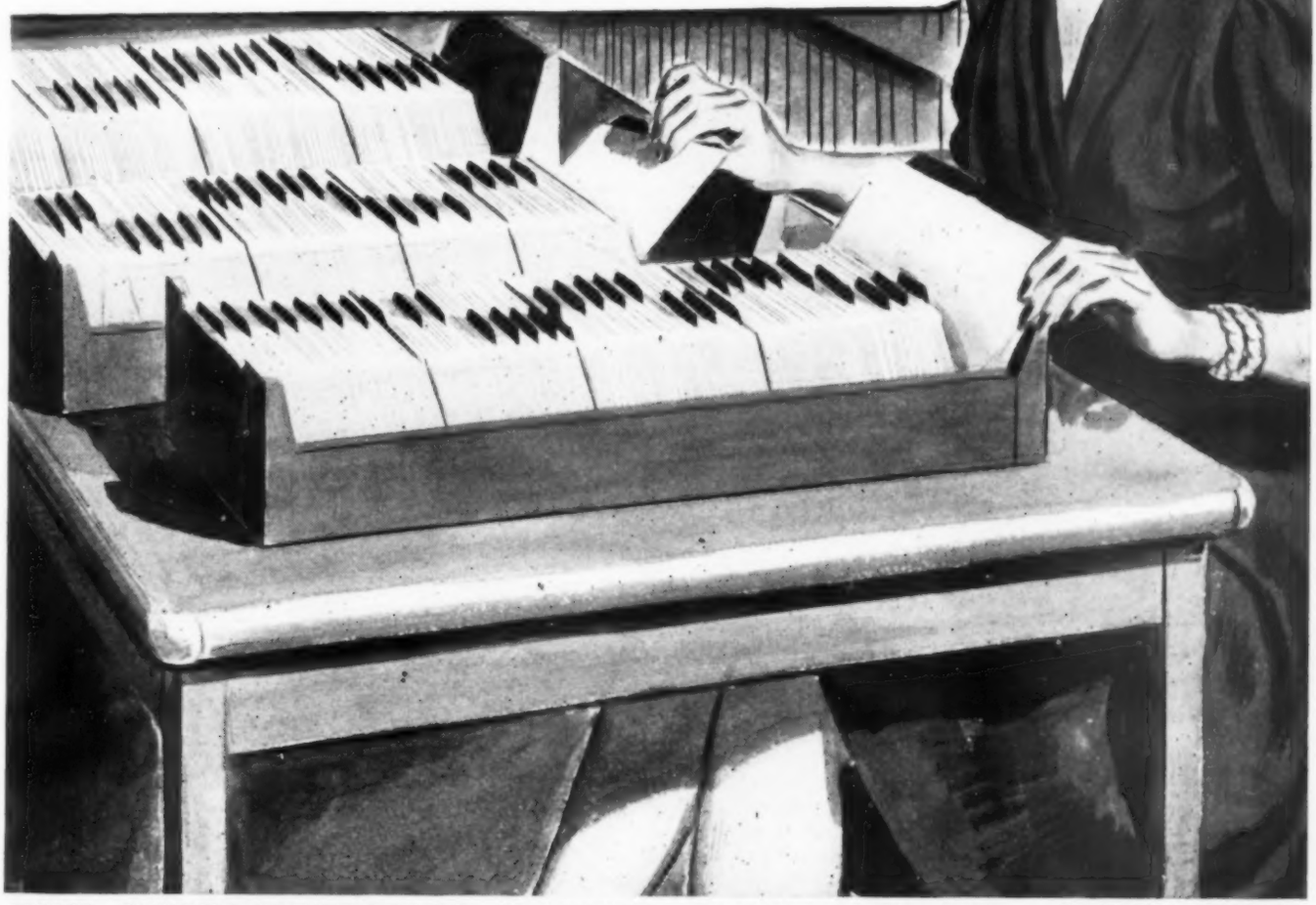
Specific answers to many of your questions about the selection, fabrication and uses of Nickel alloys are available to you quickly from our files.

This fund of helpful information we have gathered, checked and condensed into convenient printed form. The graphs, charts and shop guides are especially useful to men handling new materials or performing unfamiliar operations . . . and to new employees. This literature is available on request.

You are also offered the assistance of our technical staff in solving material problems arising from a temporary lack of Nickel. These engineers are offering timely suggestions to many vital industries during the present emergency.

Why not drop us a card asking for list of available literature. Your request for the assistance will receive prompt attention.

NICKEL



THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK, N. Y.

MEN OF INDUSTRY

H F. DUNBAR, general manager, McConway & Torley Corp., Pittsburgh, has been elected vice president of the company. He has been with the organization for more than 20 years.

♦ ♦ ♦

D. L. MCCOY recently was appointed to the board of directors of the Piasa Foundry Co., East Alton, Ill. F. E. Rhine is president.

♦ ♦ ♦

WALTER GEIST, vice president and general representative, Allis-Chalmers Mfg. Co., Milwaukee, has been elected a director of the York Ice Machinery Corp., York, Pa.

♦ ♦ ♦

J. ROGERS DAVIS recently was appointed supervisor of branches, Chicago Pneumatic Tool Co., New York.

♦ ♦ ♦

MAX W. BABB, formerly president of Allis-Chalmers Mfg. Co., Milwaukee, recently was elected chairman of the board of directors, and W. C. BUCHANAN, a director and member of the executive committee, was elected to succeed him as president. For the past 6 years

Max W. Babb

Mr. Buchanan has devoted a substantial portion of his time to the Globe Steel Tubes Co., Milwaukee of which he is president, and in which capacity he will continue. Mr. Babb in becoming chairman of the board will fill the position formerly occupied by the late Gen. Otto H. Falk, which has been vacant since his death in 1940. These changes in management were made in order further to improve the company's position, with particular reference to production, as heavy and increasing demands are being made on its facilities in connection with the nation's war work.

Office of W. R. Bean, Chief, Foundry Equipment and Supplies Unit, Office of Production Management, has been moved to 4047 New Social Security Building, Washington. The telephone is REpublic 7500, Extension 2181.

♦ ♦ ♦

FRANK J. ZIPPLER, Pittsburgh, recently celebrated the fiftieth anniversary of his entrance into the foundry field. Mr. Zippler served as a practical molder and coremaker for 12 years, and then started traveling throughout the United States and foreign countries, supervising proper installation of tuyeres in cupola. He is the inventor of a number of different designs and types of tuyeres.

♦ ♦ ♦

OTTO P. KOSSATZ, 83 Whittier place, Indianapolis, has been named representative for Ajax Electric Co. Inc., Philadelphia, in Kentucky and Indiana with the exception of the South Bend district.

♦ ♦ ♦

JOHN G. KURA has been appointed to the technical staff, Battelle Memorial Institute, Columbus, O., where he has been assigned to metallurgical research. Mr. Kura attended the University of Pittsburgh and is a graduate of Carnegie Institute of Technology. Prior to joining the Battelle staff, he was associated with the Carnegie-Illinois Steel Corp., Duquesne, Pa.

♦ ♦ ♦

R. A. BARR has been made district sales manager in the Chicago territory for the Refractory division of the Carborundum Co., Perth Amboy, N. J. Mr. Barr formerly represented the company in the Cleveland district and recently has been sales promotion manager of the division.

♦ ♦ ♦

FRANKLIN G. SMITH will celebrate the completion of 50 years' service as president of the Osborn Mfg. Co., Cleveland, on Feb. 2. For many years he also has been president of the Ohio Rubber Co., Willoughby, O. Mr. Smith was born in Bellevue, O., Oct. 23, 1867, and after a brief period as clerk and salesman for two firms, he entered the manufacturing business as operating head and manager of the Osborn Co. in 1892. At that time the company was engaged in the manufacture of brushes, and the production of the line of molding machines was begun in 1908 under the direction of the

Franklin G. Smith

late Harry R. Atwater, who later became vice president of the company. Recently Mr. Smith established two perpetual scholarships at Fenn College, Cleveland, one restricted to sons of employes of the Osborn Co., and the other to any

(*Concluded on page* 78)

To Our Nation *NOW* All Have a Greater Responsibility *Than Ever Before*

WHEN the first bomb dropped upon Pearl Harbor, our nation's defense program became history—our nation's war program a reality. ¶ Like other makers of merchant iron, our company today has a greater responsibility than ever before. To meet it, we are using our every resource to keep production at peak capacity and to maintain that standard of consistent uniformity for which Woodward Iron has become so well and so widely known. ¶ To the all important task of helping win the war, we rededicate our all-out effort with confident assurance that we shall continue to enjoy complete co-operation from all our friends in the foundry trade.

WOODWARD IRON COMPANY

WOODWARD, ALA.

America's Largest Completely Integrated and Entirely Independent Merchant Iron Producer

INDEPENDENT SINCE 1883

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

(*Concluded from page* 76)

greater Cleveland student. Since 1915 he has been a member of the board of trustees of Denison College, and has been a member of the building and grounds committee of that institution since 1925. His contributions to the art and other cultural movements have been extensive, and he has been a leader in Cleveland community fund drives for the past 21 years.

♦ ♦ ♦

JAMES K. STEVENSON and PAUL F. SPARROW have been appointed salesmen, refractories division, Norton Co., Worcester, Mass., and will have their headquarters in Chicago and Pittsburgh respectively.

♦ ♦ ♦

CHARLES A. REICHELDERFER recently has joined the research staff, Battelle Memorial Institute, Columbus, O., where he has been assigned to the division of nonferrous metallurgy. Mr. Reichelderfer is a graduate of Purdue University and is an associate member of Sigma Xi, national honorary science society. Prior to joining the Battelle staff he was connected with the Jones & Laughlin Steel Corp., Pittsburgh.

♦ ♦ ♦

R. D. LAWSON recently has been appointed salesman, machine division, Norton Co., Worcester, Mass., for Northern New England which includes Vermont, New Hampshire, Maine and parts of Massachusetts and Rhode Island. He succeeds W. E. WICKSTROM who has taken over sales engineering work at the main office in Worcester.

♦ ♦ ♦

J. HARRY JACKSON has been appointed a research engineer on the technical staff of Battelle Memorial Institute, Columbus, O., and has been assigned to research in metallurgy. A graduate of Rensselaer Polytechnic Institute, Mr. Jackson was associated with the Caterpillar Tractor Co., Peoria, Ill., as metallurgist and welding engineer for 5 years prior to joining the Battelle staff. He is a member of the American Society for Metals and Sigma Xi, national honorary science society.

♦ ♦ ♦

F. L. CURTIS, general manager, Manhattan Rubber Mfg. division, Raybestos-Manhattan, Inc., Passaic, N. J., recently has been appointed vice president, Raybestos-Manhattan, Inc. Mr. Curtis has been associated with the company since its beginning in 1893. In addition to his new duties, Mr. Curtis will continue as treasurer of the corporation. H. E. SMITH, assistant general manager, Manhattan division, was appointed to succeed Mr. Curtis as general manager. J. H. MATTHEWS, formerly assistant factory manager now is assistant general manager. Both Mr. Smith and Mr. Matthews have been with the Manhattan division for many years.

Washington office of the Gray Iron Founders' Society, W. W. Rose, Executive Vice President, has been moved to 1719 "K" Street, N. W., Washington. The telephone is REpublic 4750.

♦ ♦ ♦

JOHN MCBROOM has joined the engineering staff, Hydro-Arc Furnace Corp., Chicago. After graduating from the University of Minnesota in 1936 in mechanical engineering, he became affiliated with the Duraloy Co., Scottdate, Pa., as metallurgist. From December 1937 to May 1941, he was in the service and sales department of the Pittsburgh Lectromelt Furnace Corp., Pittsburgh, leaving to do experimental work on an ore reduction process in Longview, Tex. That work was completed at the end of the year and Mr. McBroom went to Chicago to take up his new work. He is a member of the American Foundrymen's Association, and American Society for Metals.

♦ ♦ ♦

SAMUEL E. BOOL has retired from the partnership of Pickands Mather & Co. Cleveland, after an active association of 54 years. Mr. Bool joined the company Dec. 15, 1887 and served in many capacities including bookkeeper, cashier, and auditor. He was admitted as a

Samuel E. Bool

member of the firm in 1923, and he has devoted most of his time to financial affairs of the company and its affiliates.

JOHN SHERWIN, ALEX D. CHISHOLM, HERBERT C. JACKSON and GEORGE W. STRIEBING, were admitted to Pickands, Mather & Co. as partners Jan. 1, 1942.

♦ ♦ ♦

W. L. KENNICOTT recently has been transferred to the head office and factory of McKenna Metals Co., Latrobe, Pa., in the management of sales and of engineering of Kennametal tools and their application. He formerly was Los Angeles sales manager of that company. Mr. Kennicott is a graduate metallurgical engineer, University of Utah, and has had a substantial part in the development of the company's product.

♦ ♦ ♦

R. HOWARD WEBSTER and RICHARD J. BUCK, New York; WARREN W. YORK, Allentown, Pa.; and W. CAMPBELL SHAW and W. COLIN WEBSTER, Montreal, have acquired an interest in the National Roll & Foundry Co., Avonmore, Pa., and now constitute with WILLIAM H. SEAMAN and F. J. KAIB the board of directors of the company. R. HOWARD WEBSTER is chairman of the board. Mr. Seaman remains president and general manager. Mr. York and Mr. Buck are vice presidents while Mr. Kaib continues as secretary and treasurer.

♦ ♦ ♦

DR. R. G. SPENCER, research physicist, Armour Research Foundation, Illinois Institute of Technology, Chicago, has been appointed chairman of metallurgical research to care for expanded industrial research projects recently undertaken at the institute. Dr. Spencer formerly was head of the department of physics at Albion College. Five new appointments also were announced: DR. W. H. EARHART, ceramist from the Edward Orton Jr. Ceramic Foundation, Columbus, O.; GEORGE STERN, metallographer, formerly associated with the American Electric Metal Corp., Yonkers, N. Y. will assist in the metallurgical section; DR. CLYDE W. LEAF, formerly with Givaudan-Delawanna Inc., New York; CLARK E. THORPE, from Ozo-Ray Process Corp., Chicago, and ROBERT C. BOUR, formerly development chemist, Ditto, Inc., Chicago, have been appointed to the chemical engineering section.

The following organizations have been appointed representatives of the Cleveland Quarries Co., Cleveland, for the sale of silica firestone: Muir Foundry Supply Co., 49 Simcoe street, Toronto, in Ontario and eastern Canada; Industrial Supply Co., 2309 Adeline street, Oakland, Calif., in central California, Oregon and Washington; and A. L. Cavedo & Son Inc., 1717 Summit avenue, Richmond, Va., in North and South Carolina.

HOW TO KEEP shrinkage cracks OUT OF non-ferrous castings

CORES made with Truline* Binder are just the thing for intricate castings of magnesium and aluminum, because they collapse so fast that there's little chance for core resistance to cause shrinkage cracks.

But this is only one advantage of using Truline Binder in non-ferrous castings. You'll find that sand is easily and quickly removed. Shorter baking time gives you more core oven output.

Convenient-size Bag Is Easy to Handle

And for magnesium: You can bake cores at temperatures as low as 300° F. This means you can put inhibitors right in the mix—instead of spraying on the baked core surfaces.

It all adds up to more sound finished castings, turned out faster at less cost. Clip the coupon to your letterhead and mail it today. We'll see that you get the facts about Truline Binder and a sample if you want it.

HOW TRULINE BINDER INCREASES PRODUCTION IN MANY FOUNDRIES

SAVES TIME ON BAKING Truline Binder bakes through quickly—increasing core oven output. Time saving is sometimes as much as 30%.

SAVES TIME ON CLEANING Cores collapse quickly; this makes cleaning faster. Some foundries have cut cleaning time 50% with Truline Binder.

SAVES TIME ON RAMMING Flowability of Truline Binder mix speeds ramming, particularly in green sand facings.

*Reg. U. S. Pat. Off. by Hercules Powder Co.

TRULINE BINDER
Reg. U. S. Pat. Off.
NAVAL STORES DEPARTMENT
HERCULES POWDER COMPANY
Incorporated
WILMINGTON, DELAWARE
CHICAGO NEW YORK ST. LOUIS SALT LAKE CITY SAN FRANCISCO

HERCULES POWDER COMPANY
999 Market Street, Wilmington, Delaware

Please send ☐ Sample ☐ Information on how to use Truline Binder in casting:
☐ Aluminum ☐ Magnesium ☐ Other Non-Ferrous Work

Name.....
Company.....
Street.....
City..... *State*.....

JJ-43

THE ADVENTURES OF BILL

BY PAT DWYER **Drawings By RICHEY**

THE wind had been rising steadily all day and the thermometer had been dropping steadily during the same time. The thin red line extending upward to the 100-degree mark at the peak of the summer now had shrunk down around the zero mark. Made me think of a long ago period in my existence when members of the gang covered themselves with glory—and goose pimples—by taking the first dip in the river some time in May. This was no shallow inland creek where a few days of spring sunshine made the water habitable. The river was deep and wide where an icy tide from the open sea flowed in and out twice a day. I did not know where the river had its origin, but the first few shivery dips led me to suspect that it was located some where at the base of a glacier. 'Tis true even the oldest inhabitant never made any reference to one of the icy mountains. Later more extended knowledge of the country showed no trace of a glacier, or of the path which one of these monsters had ripped through the terrain in its almost imperceptible journey to the sea.

I wonder why some of the clever lads who coin phrases, never used the glacier as a synonym for slow motion. Telling a person he or she is as slow as cold molasses has its merits, but it seems to me that telling the same person he or she is as slow as a glacier should touch the accelerator. The only draw back to this idea is that such a dashed comparatively small number of people have any knowledge of a glacier and its habits. As with many of our best bonmots and flashes of wit, the entire effect is destroyed if one has to supply an explanation, a set of drawings, a map and a time table. The mental glow experienced in administering the stinging rebuke, with or without strengthening adjectives, "You are as slow as a glacier," would kind of lose its glamor if the party of the second part with a species of low cunning peculiar to parties of the second part should retort, "So's your old man. Gimme me time!"

You probably have skipped this digression, or if you are one of the hair trigger boys you have said to yourself, "A fine old crab you have turned out to be, leaving these innocent little boys shivering, shaking and shrinking, while you blithely knock out a lot of silly theories on a typewriter. Kindly stick to the

The stuff of which heroes are made

point and lift the boys out of the icy river before they catch their death of pneumonia, or shrink to a point where their future growth is permanently stunted. You and your glaciers make me tired."

Here, dear friend, is where you are mistaken on two counts. First, no person is needed to lift these young hellions out of the river. They go in the river against the expressed wish and command of their parents, but they come out shivering and shaking, shrunken to half their size after the first dip and at a speed more like that of a racing greyhound, than that of a glacier.

The second point on which you are mistaken touches on the possibility of the boys developing pneumonia. They never did, and what you think of that?

When I laid this second point before Bill I was highly gratified to find that his memory of the old swimming days was as good as mine.

"You know the old saying," quoth the oracle, "about a special providence that watches over people who have not all their buttons, babies and drunks. I think this should be expanded to include hare brained boys who go in and get ducked in icy water. Look at the sailors and members of the armed force sent to Iceland. They are exposed to more dangers than the apostle Paul enumerated in one of his well known epistles to the faithful with names as long as your arm. I can't remember the names off hand and if I did know them I could not spell them. In fact I never did learn to spell these long words. Whenever one was introduced in the old spelling bees I always fell down flat."

"If you had paid any kind of attention to the preacher or the benevolent sunday school teacher who tried—vainly I am afraid—to expound these epistles you would remember them. You probably spent these golden hours thinking up new and refined methods of skullduggery to be practiced on the nice little boys in your immediate circle. For your general information, although I doubt if it will do you any more good than the same information administered in the far away and wasted years of your youth, for your general information, Paul, as the saying goes, went to town on the list of his adventures and perils in his second epistle to the Corinthians, 11, 22 to 33."

"Boy," said Bill admiringly, "you know all the answers, don't you? If I was in your place I would horn in on one of these here now quiz programs on the radio and knock myself off a hunk of jack. I wonder if you know the answer to a very peculiar question that was fired

(*Continued on page* 82)

AMERICAN MONORAIL *Relieves* "PRODUCTION JITTERS"

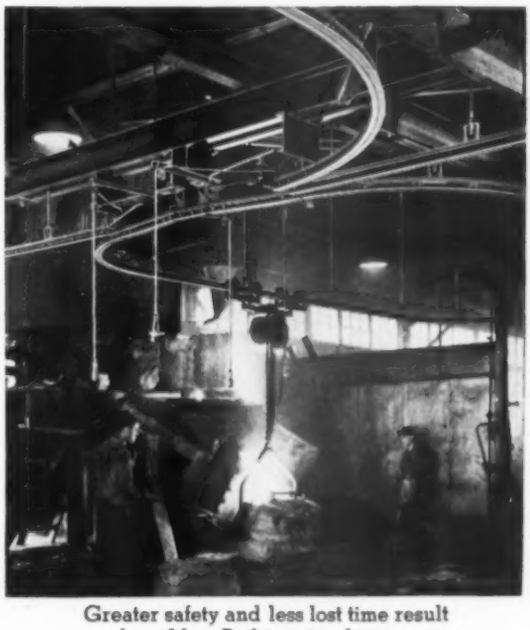
Hot metal gets faster distribution over a well designed MonoRail System.

AMERICAN MONORAIL
OVERHEAD HANDLING EQUIPMENT

"HIGH re-handling costs through process"—"Production tied up by floor congestion" — "Too much handling by skilled labor" — these and many other "production jitters" are being easily and quickly "cured."

The American MonoRail Engineer has the right prescription for putting production on an efficient basis.

Whatever your handling problem may be, it will pay you to talk with an American MonoRail Engineer. He will explain the benefits of American MonoRail Overhead Handling Equipment particularly suited to your individual problem.



Greater safety and less lost time result from MonoRail tapping loops.

Send for copy of Blue Book. See the American MonoRail Engineer Immediately. →

Easy rolling trolleys on overhead MonoRail assure accurate pouring.

The American MonoRail Co.

13104 Athens Avenue · · Cleveland, Ohio

(*Continued from page* 80)

at me one night many years ago in Montreal."

"I suppose the question was 'Is you is, or is you ain't goin' to pay anything on yo' boa'd bill this week, Mistah Bill.' "

"You don't get no eleven silver dollars for that one. In fact it is so wide of the mark that it does not even deserve a stick of chewing gum or a sample half ounce package of bird seed.

"Me and Fred Maple and Jack Wolf and several other fellows—you know them all—were working in the steel shop out at Long Point—they spell it different up there, but that is neither here nor there—"

"What do you mean, neither here nor there? The plant is still there."

"You don't tell me! I thought perhaps they shut it down after I pulled out. Listen, I was not referring to the plant. I was simply reminding you that many words that sound alike in French and English, are not spelled the same way. Presumably you are aware that Montreal is a French city—"

"Push on, man. Push on. I have been in Montreal many times. En avant, mon garcon!"

"Well, well! You speak the language like a blinkin' native. I was there six months and all the French I picked up was 'Hey, garsong, two beers' and even then I had to hold up two fingers.

"As I was saying, or as I intended to say when you rudely interrupted, I was plowing my way through the snow one night when I stumbled over the body of a man. When she snows up there, she snows and no kiddin.' For a few minutes I debated whether I should pick him up, report him to the police or just anticipate the john darms, look through his pockets and leave him there. You can imagine my astonishment when I turned him face up and recognized the crooked puss of Horatio McCarthy."

"Do you mean Red?"

"No more and no less. Old Red himself, better known far and wide as Rain-in-the-face. The third drink invariably touched off a spring of some kind and the tears poured out of his eyes. He did not care what he was called so long as he was not addressed as Horatio. This indignity committed on him when he was a helpless infant was one of his favorite topics when the tears flowed in volume almost equal to the Lachine rapids.

"I finally stood him on his wabbly feet and mind you that was no mean job. Outside of trying to carry a mattress up a crooked, narrow stair, I don't know of any load more awkward than a drunken man wrapped in a big ulster. The night was piercingly cold, something like tonight and I was afraid if I left him there he would congeal into a solid block. With proverbial stubbornness, he refused to move. In the darkness and in his befuddled condition he did not recognize me.

" 'Who'r you?' he demanded. 'Tell me where to go and where not to go. Free country. Go where I please. On yer way can ile.' "

"The word," I said to Bill, "is canaille, meaning riffraff, slum dwellers, dregs of the people, in other words down and out bums with a vicious complex."

"Was that what he said? If ever I see him again I'll can ile him. Well, anyway I decided to use a little strategy on him. 'My friend,' I said, 'I am the apostle Paul.'

"No one can figure the track of a drunk's mind. 'Jus' man I wan' see,' sez this drunken barnacle. 'Give me answer to ques-ques-quession been botherin' me for years. Tell me did ya ever get an answer to them long winded epissels ya wrote to them whad-ya-may-callems, Corinthians, Thessal-thessal, on Thessal something or other, ya know them there foreigners?'

"Too much for me. Now if he had asked me something about the foundry I could make some kind of a stab at the answer. Some time back I had a kind of a compound question from a foreign foundryman. 1—What kind of chaplets are employed on hot water boiler sections. 2—What kind of an arbor is used in a green sand core in a U-pipe. 3—Are core rods or arbors used in boiler and radiator cores. 4—What is the best way to mold a rectangular sewer basin with a spout at one side.

"In my reply I pointed out that apparently he did not read THE FOUNDRY closely. All those questions about the boiler sections have been covered several times during the past few years. If he had a back file I directed his attention specifically to the issues of Jan. and April 1, 1922. If he had no back file I might say briefly that the cores are supported on stud chaplets top and bottom. The chaplets in turn come in contact with suitable small plugs either cast on or bolted to the flask bars. Radiator chaplets are rammed in the mold with the pattern. The thin square head remains in the sand and the small straight stem sticks into the pattern for the thickness of metal. When the pattern is withdrawn it leaves the chaplets in place in the mold. No wires or rods are used in radiator or boiler section cores.

"Several methods are used for hooking the ends of the *U*-pipe arbor together. Perhaps the easiest way is to cast in two steel loops either round or square about 3 inches apart on top and near the

(*Concluded on page* 86)

He has the proper stance and only lacks the dog team and a pair of sled runners. Mush

Molybdenum Steels meet exacting service requirements without increasing costs

A considerable saving has been brought about by making the vital cone clutch in a draw works assembly of cast Manganese-Molybdenum steel.

This steel, containing 1.20%-1.50% Mn and 0.30%-0.40% Mo, develops ample strength and hardness when double normalized and tempered at 1200° F.

Without sacrifice of serviceability, costs have been reduced by adopting this steel, noted for its excellent physical property-cost ratio.

You will find the complete data on Molybdenum steels in our technical book, "Molybdenum in Steel", helpful. A copy will be sent free on request.

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.
MOLYBDIC OXIDE—BRIQUETTED OR CANNED • FERROMOLYBDENUM • CALCIUM MOLYBDATE

Climax Mo-lyb-den-um Company
500 Fifth Avenue • New York City

MOLY

By A. H. ALLEN
Detroit Editor, The Foundry

AMONG DETROIT FOUNDRIES

FULL impact of war on the industrial pattern of American life is close at hand, and is going to bring some major upheavals, particularly in respect to gray iron foundries. The present outlook for such foundries is for considerable curtailment of operations for the duration of the war, for the reason that large-scale needs for gray iron in war equipment as yet are not extensive.

One hundred and eighty, or well over half of Michigan's 313 foundries specialize in gray iron, and a far greater proportion of the state's annual melting capacity of 2,789,000 tons is devoted to gray iron. The large automotive foundries, with normal output ranging up to around 2000 tons a day or better, primarily account for the preponderance of gray iron in that state. Those foundries admittedly face serious curtailment if not complete extinction for the duration.

Such foundries are geared, equipped and staffed to produce automobile castings up to about 400 pounds in weight, in mass production quantities. Their personnel, while large, is not particularly skilled; whatever skill is required being built into the automatic equipment with which the plants are so completely filled. Now that prospects are for nearly complete suspension of automobile manufacture, at least after February, there is no mass demand for such smaller types of castings as motor blocks, heads, flywheels, gear cases, etc. And as yet, ordnance needs for gray iron are practically nil.

Truck production will be continued on a large scale—large, that is, for the truck industry—but inconsequential alongside the passenger car industry. New types of tactical vehicles such as that for which Dodge now is tooling, will require the usual types of gray iron automotive castings, but so far Chrysler's order for this vehicle is only 80,000, or about 3 weeks of normal production of passenger cars for the entire Chrysler Corp.

It is likely, however, that the large Dodge foundry will be kept going, for a time at least, on war orders. The tactical vehicle just mentioned will need castings. Also, there is a proposal now under consideration to use Plymouth automotive engines in the Chrysler-built army tank, with five engines to the tank. If this matures, about 200 engines a day would be required, but there is still plenty of argument over whether the present type of high-speed automotive engine is a tough enough piece of equipment for the grueling service which tanks must undergo. Another possibility for gray iron castings is in tank transmissions, which are understood to have been redesigned from cast aluminum to cast iron. So the situation is not too bad as far as the Dodge foundry is concerned.

C. E. Wilson, president of General Motors, said in a recent press conference that the corporation's four gray iron foundries—Buick, Chevrolet, Pontiac and Cadillac—along with the several stamping plants and outlying assembly plants operated by GM, faced almost complete curtailment of operations during the war program.

May Have To Change

Two possibilities have been suggested to keep the gray iron motor foundries going. Both involve extensive changes in equipment, but might be realized without too serious a dislocation. One is to change over to production of heavy gray iron castings for machine tool beds, frames, columns, ways and the like. The other is to install new melting equipment and move into the casting of aluminum and magnesium, needed in large quantities for airplanes, tanks and other war equipment.

As far as production of machine tool castings is concerned, changing over the motor foundries would in many cases involve some fairly extensive additions to and changes in plant equipment. Heavier cranes, larger ladles, removal of small conveyor systems, alterations to molding equipment and related shifts would have to be worked out. However, the superintendent of one of the motor foundries has expressed the opinion that the change could be made in his plant. This raises the question as to the effect on the hundreds of smaller jobbing foundries which now are engaged in production of machine tool castings. There is also the problem of experienced personnel, principally molders, to handle production of these machine tool castings. Skilled molders are scarce in the motor foundries, not so scarce in the jobbing foundries.

Somewhat more feasible is the proposed change to production of aluminum and magnesium casting. One of the upstate motor foundries already is studying this matter carefully, the major concern at the moment being over whether sufficient metal could be obtained to keep the foundry going at anywhere near its capacity, once the necessary changes in equipment had been completed.

Already there have been large-scale shifts of foundry personnel to plant departments more closely related with war work. Many foundry workmen at the Packard plant, for example, having been moved over to jobs in the Rolls-Royce aircraft engine division. Workmen in the foundry cleaning room, as well as coremakers and similar personnel have been transferred to bench jobs in the aircraft plant, one group, for instance, being assigned to operate small portable tools used to clean up aluminum and magnesium castings going into the engine.

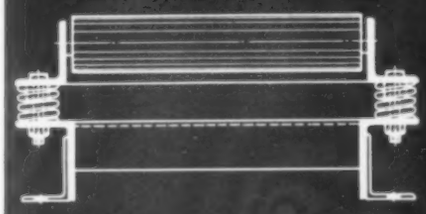
To keep the Packard foundry staffed, new men have had to be hired to replace those transferred. The plant is operating one shift a day, but following completion of January production quotas on Packard assemblies, there will be no need for more automotive castings. Early in January there was the possibility of a new war order being received which would require some cast iron. No information is yet available on what type of equipment this is or how much would be involved.

Space adjoining the Packard foundry, once occupied in production of aluminum castings, and which might now come in handy if it were still available, was taken over recently by the aircraft division for steel storage, so aluminum casting appears out for the time being.

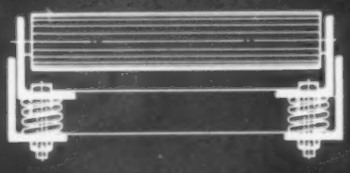
There is no lack of demand for steel castings in the war program, and if some gray iron foundries

(*Concluded on page* 86)

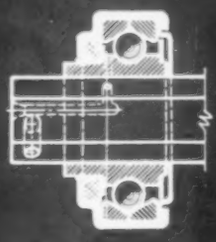
MATHEWS CONVEYERS engineered for foundry service



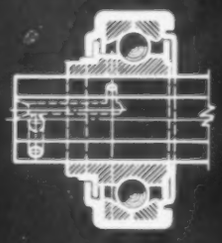
STYLE No. 1 CONSTRUCTION



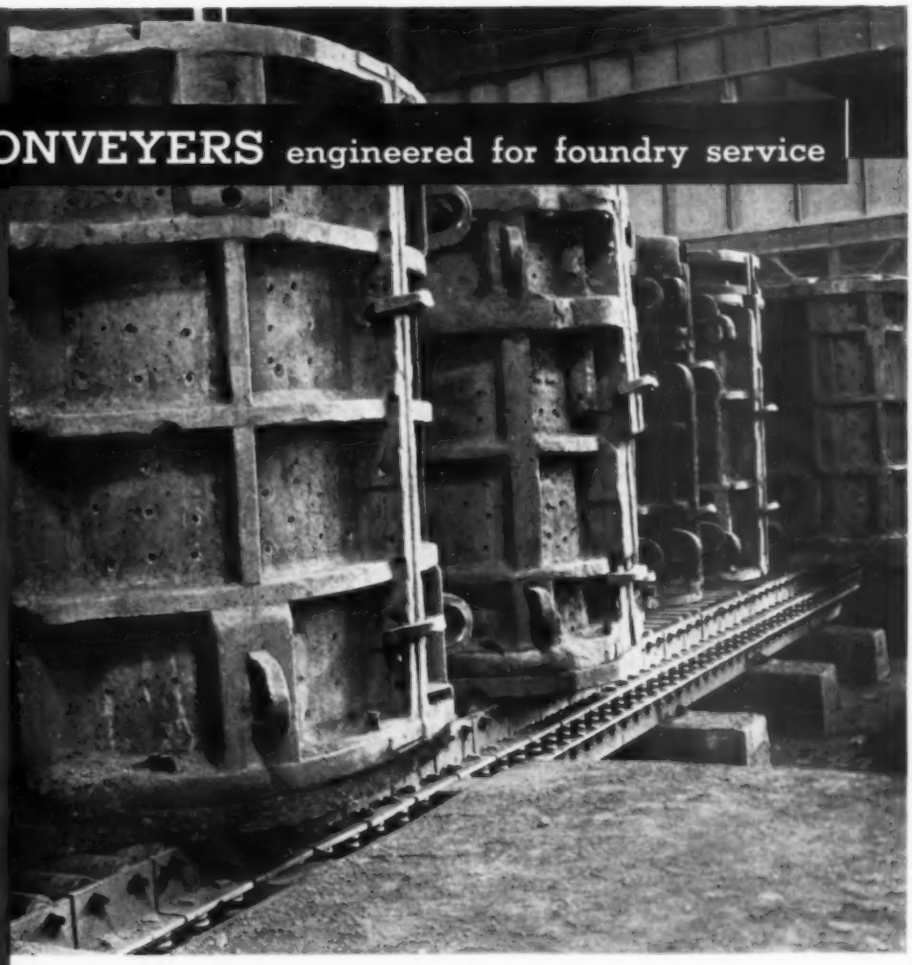
STYLE No. 2 CONSTRUCTION



TYPE AB BEARING SHOWING FELT AND STEEL LABYRINTH SEALS AND DRILLED FOR PRESSURE LUBRICATION



TYPE SB BEARING SHOWING STEEL LABYRINTH SEALS AND DRILLED FOR PRESSURE LUBRICATION



SPRING MOUNTED SECTION HANDLING 20,000 LB. MOLDS

● For more than 20 years Mathews engineers have carefully considered the Material Handling requirements of foundrymen. The severe service to which foundry conveyers are subjected has demanded a construction which can withstand heavy loads, shock, abrasive sand, and a minimum of maintenance attention. These years of engineering effort have attained a practical solution to this problem.

Heavy duty rollers fitted with labyrinth sealed, pressure lubricated ball bearings and set in pre-compressed spring-mounted structural frames, comprise the most rugged roller conveyer available to the industry at the present time.

Because it reduces maintenance costs to a minimum and outlasts the conventional rigid type roller conveyer many times, it is quite attractive from the standpoint of economy. An illustrated folder explains in detail the principle of this practical roller conveyer construction. We would be glad to send you a copy upon request.

Keep in mind the Mathews engineer in your vicinity who is eager to help you with your Material Handling difficulties.

MATHEWS CONVEYER COMPANY

PORT HOPE, ONT. ELLWOOD CITY, PENNA. SAN FRANCISCO, CALIF.

(*Concluded from page* 84)

could procure a bessemer converter they might salvage some business for the current emergency. Nearly all steel foundries right now are up to their ears in orders and plants like Campbell, Wyant & Cannon, which produce both gray iron and steel, are concentrating almost exclusively on various types of steel castings. That this fact generally is realized among local foundries is reduced easily from the virtual rush to find out how soon and at what expense bessemer converters can be obtained. Both gray iron and malleable foundries are participating in the rush and actually it would be easier to list the foundries not interested in converters than those who are actively considering new installations.

Complete understanding of what is involved in switching from gray iron or malleable to steel by installation of a converter is going to mean abandonment of the idea by most of those now inquiring. The actual cost of the converter is the least of the considerations. There are so many other factors and costs involved that it is unfortunate they are not more generally understood.

One converter installation that is going ahead is at Saginaw Malleable Division where four 3-ton units will be installed. Apparently to be operated in conjunction with new cupolas installed there recently, the converters will supply steel for some as-yet undisclosed armament needs.

Actually, it should be pointed out that the closing down of certain foundries will likely not result in any great unemployment problem. The men, including supervisory forces, will be transferred to other activity. True, they may require some training, but they will be trained and kept on the job. That seems certain, from statements made at the press conference with Mr. Wilson mentioned previously. He said that GM expects to have the equivalent employment of June, 1941, at work on war orders by the end of this year. In June, 1941, GM employment reached a peak of 303,483, including salaried employes.

Adventures of Bill

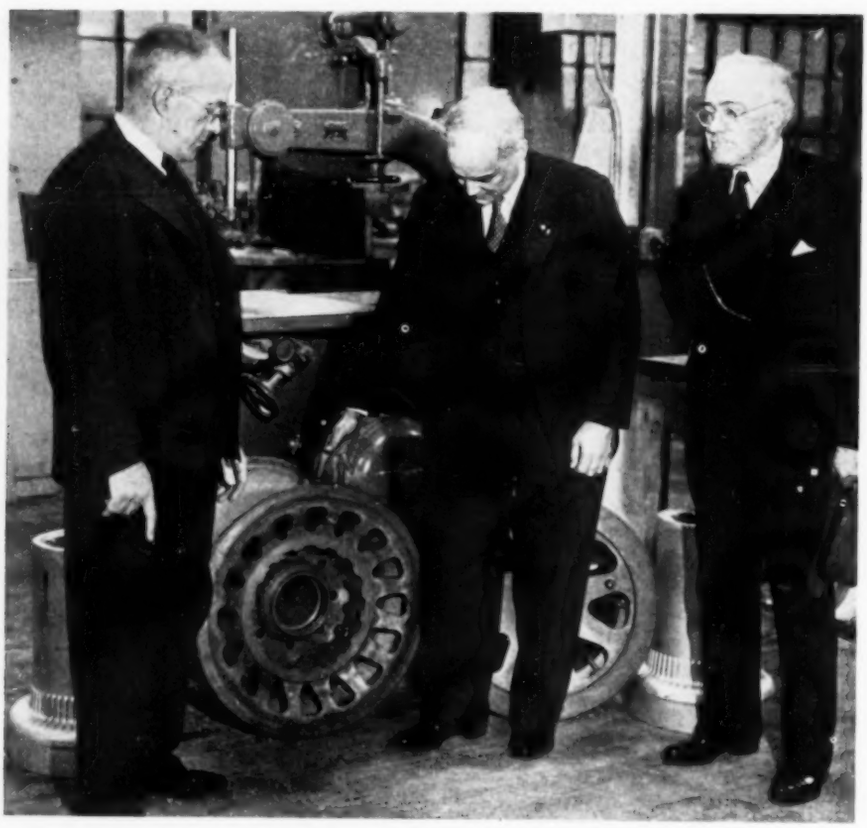
(*Concluded from page* 82)

end of each half of the arbor. Before the arbor is placed inside the pattern, which also serves as a corebox, the ends are brought together, a round or square bar is slipped through the four loops and a wood wedge is driven on top to hold the joint tight. Another way is to provide a rectangular opening in the end of one arbor and a rectangular prong, slightly smaller in the end of the other half. When the ends are joined a wood wedge will hold them in place. In a third method the ends are hooked together in the manner in which the bent fingers on one hand grip the bent fingers on the other hand. A wood wedge driven down from the top behind one bend will hold the two parts in place.

"The simplest method for making the gully with a spout at one side is to mold it closed end down. Lift the inside body of sand by a rectangular piece of slab core suspended from the cope bars and drop a dry sand stop-off core into a suitable print over the spout. The dry sand core inside the spout would rest on a print at the outside end and on a stud chaplet on the inside. A light fin would have to be knocked out of the casting on account of the slight clearance between the inner end of the spout core and the main core suspended from the cope."

"All very neat," I admitted. "Ship shape and Britol fashion. I regret that I cannot do as good a job on Paul's return correspondence. Next time you see Red just say NO."

"If I ever see that scut again, I'll tie a tin can to his can ile tail. That will give him something to do instead of worrying over the Scriptures."



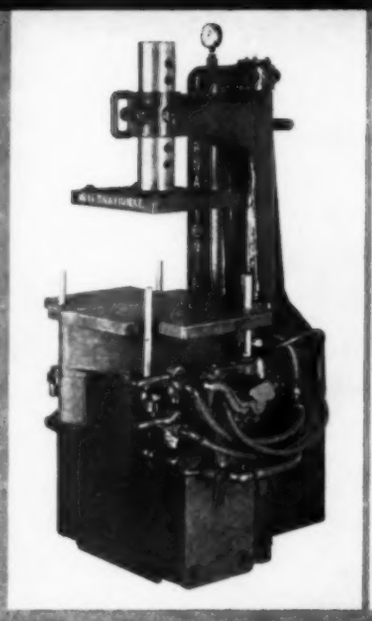
United States Senator Harold H. Burton (center) examining magnesium alloy castings to be used as wheels on bombers in the new Peerless plant of the Wellman Bronze & Aluminum Co., Cleveland, which recently began operations. Fred Wellman, president of the firm is shown at the left and Holley G. Wellman, vice president, is at the right

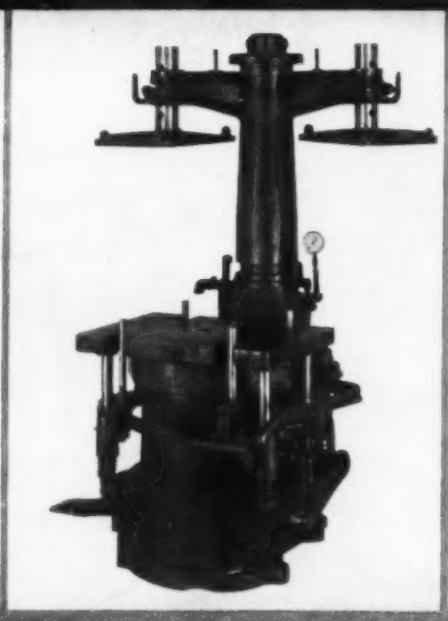
Publishes Booklet

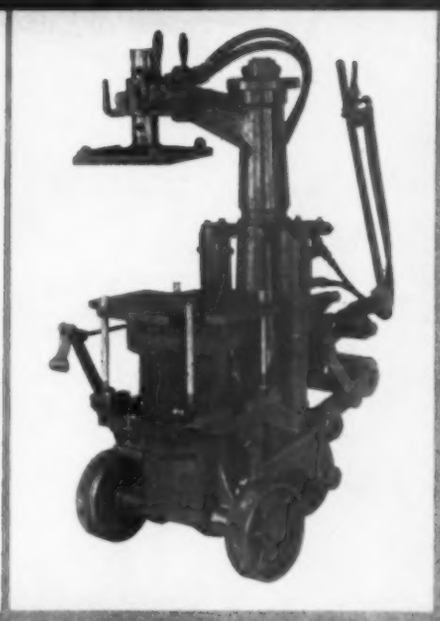
Great Lakes Foundry Sand Co., United Artists building, Detroit, recently has published an interesting and instructive booklet entitled, "Foundry Sand Control." The comprehensive compilation of information on sand practice in the modern foundry was prepared by Harry W. Dietert, Detroit. The following headings indicate the scope of the material presented: Introduction; casting defects (analysis and correction); water content (moisture of sand); clay content of sand; grain size (A. F. A. fineness—distribution); mold hardness; sea coal in molding sand; hot strength in foundry sand; volume change in foundry sand under heat; molding sand formulae; sand control through a routine testing program; bake, oil bonded cores; collapsibility of cores; and appendix of useful tables. The book is priced at $4.00 per copy.

Enlarging its field of service to Canadian industry, Mine Safety Appliances Co. of Canada, has acquired a new building located at 139 Kendal avenue, Toronto, where a broad line of approved safety equipment will be available. The firm will manufacture and assemble certain products and stock all important items.

INTERNATIONAL MOLDING MACHINES





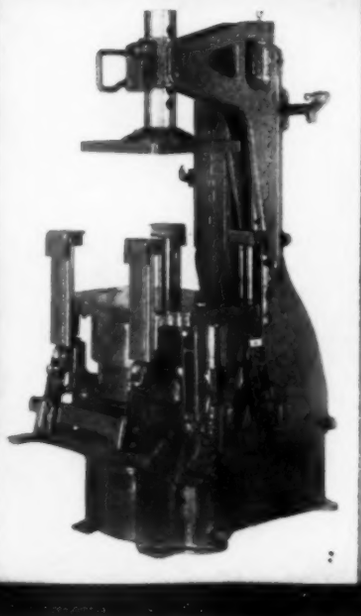


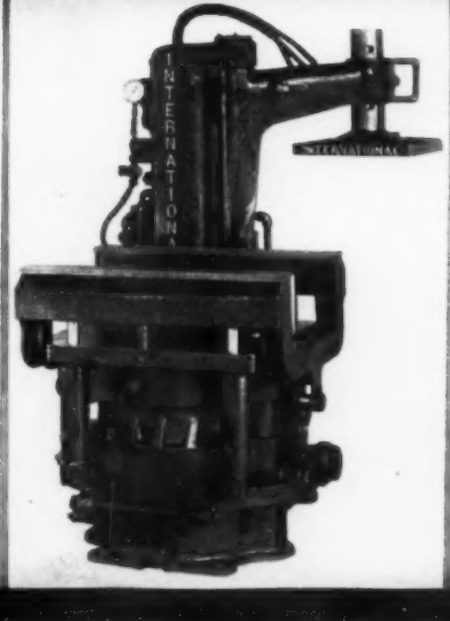
All of the 70 different types of machines that we build are made in a wide range of sizes. Each type is made in a variety of designs. The six machines illustrated are representative of our line of

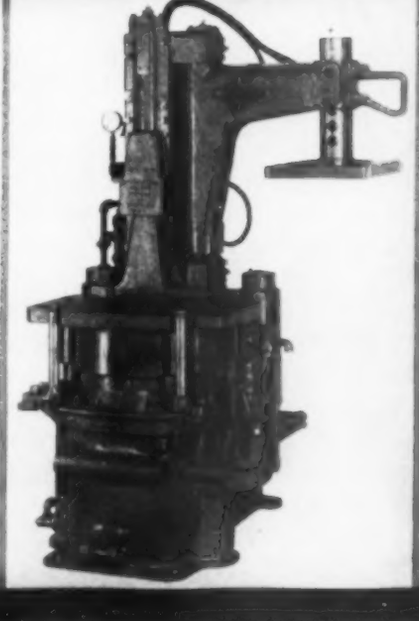
JOLT SQUEEZE LIFT and STRIP MACHINES

used for copes on *high production* work in combination with our various types of JOLT TURNOVER DRAW and JOLT SQUEEZE TURNOVER machines for drags.

INTERNATIONAL Blowers are used in *high speed* shops for blowing cores weighing from 1 oz. up to 250 lbs. and over.





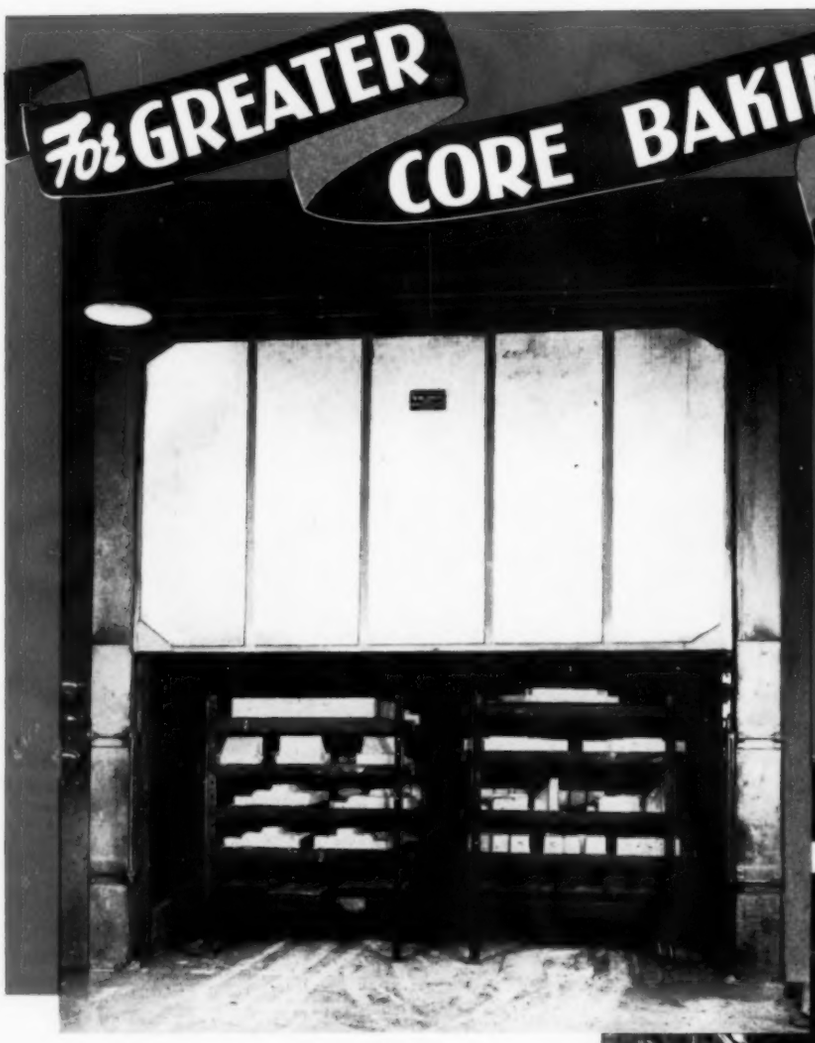


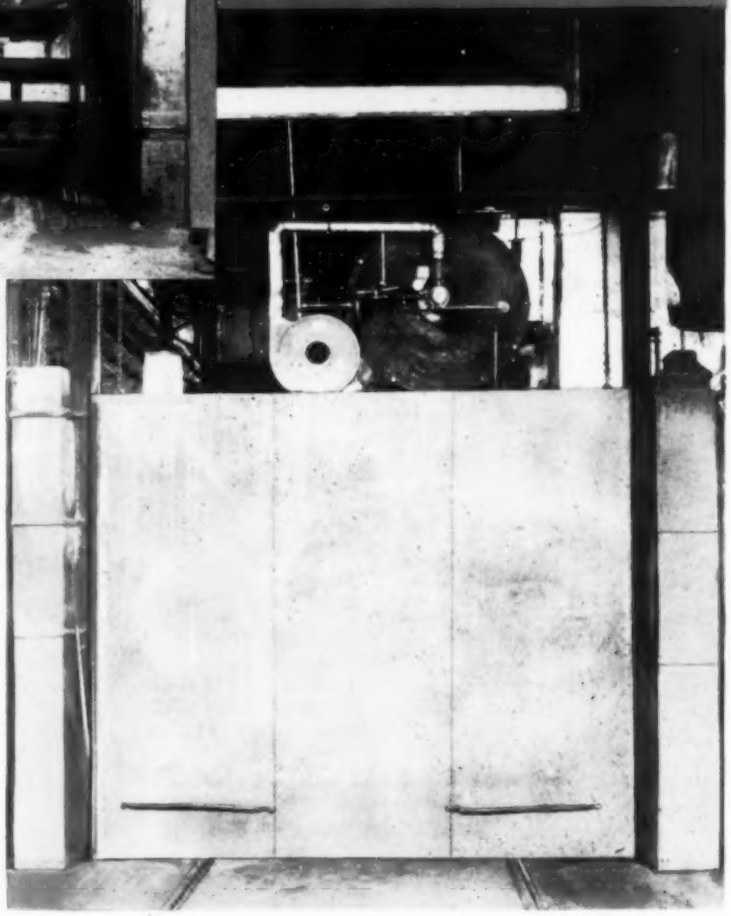
INTERNATIONAL MOLDING MACHINE CO.

2608--2624 W. 16th St., CHICAGO, ILLINOIS

For GREATER CORE BAKING EFFICIENCY at

GREENLEE BROS.
Rockford, Illinois





LIKE dozens of other plants, hard-pressed to meet a constantly swelling volume of orders, Greenlee Bros., Rockford, Ill., have turned to the Maehler way of baking cores. The Maehler oil or gas fired recirculating air heat system on a new Maehler oven or applied to old ovens speeds up core baking production, produces better cores, reduces floor space required, eliminates smokiness and reduces costs. Records show core baking time reduced as much as 65%; one Maehler Oven doing the work of five and six old ovens; quality of cores perfect every bake. These are typical results and you can get similar ones with new Maehler equipment. Take the first steps *right now!* Write for details.

Upper Left — New Maehler double width lift door core oven with recirculating air heat system.

Above — Old style coke heated core oven modernized with Maehler oil-fired, recirculating air-heat unit.

THE PAUL MAEHLER COMPANY . . . 2200 W. Lake St., Chicago

COMMENT

IT NOW seems probable that the increased production program for the machines of war will create such demands for strategic materials, especially metals, that there will be little or nothing left for foundries not producing war work. The situation with regard to iron and steel scrap is receiving attention by national and local officials and while collection drives may help some, real progress depends on clearing up red tape which now prevents the wrecking of many abandoned bridges, unused street car lines, and similar potential scrap sources where ownership or control is in doubt. Recent orders governing collection and distribution of nonferrous scrap of various kinds will have a pronounced effect on nonferrous foundries.

Percentage of pig iron allocated on B priority ratings is reported to have increased slightly from September through November. In December and January the percentage dropped successively so that during the past month, the percentage was approximately the same as in September, the first month of allocations. The decline in percentage probably will be much sharper in February, due to the fact the furnaces will operate practically 10 per cent less than in January. Many familiar with the problem believe that shortly practically no iron will be available on B priority ratings.

The foundry industry is in the difficult position of being absolutely dependent upon critical war materials in the production of castings, either ferrous or nonferrous. While it is estimated that a high percentage of the productive capacity of the entire industry now is engaged in war production, either direct or indirect, but carrying a rating of A-10 or better, there remains a considerable number of individual plants still making civilian goods, much of which ordinarily would be considered absolutely essential to the welfare of the civilian population. Fate of these non-war plants in the months to come will depend largely upon the ability of individual managements to find war needs for castings, and to convert plants and train men to the new tasks.

One note of warning should be sounded. Already some plants having insufficient war work are trying to better their situation by stealing work from shops that have had the foresight previously to direct their energies to war production. Price cutting at this time for the purpose of taking orders away from competitors is neither patriotic nor good business. The case for the industry is considerably weakened by such actions.

—□—

The Tools and Equipment Branch of the OPM has been conducting a survey of gray iron foundries to determine additional facilities available for the production of machine tool castings of various sizes. The information being provided by this study is of great value to machine tool builders and should aid greatly in distributing further war business to the foundry industry.

Numerous foundrymen are using the advertising pages of the business press to tell of the applications of their products in the present emergency. The illustration above, which seems to be exceptionally effective, appeared a few weeks ago as a full page advertisement in several business papers.

—□—

Now and then the foundry industry is accorded excellent publicity in the daily newspapers. For example, some weeks ago Al Williams of the Scripps-Howard papers carried the following in his daily column:

"The automobile industry is bringing mass production answers to the aircraft industry by perfecting the casting and thus eliminating the costly forging. For instance, an aircraft engine cylinder made from an expensive forging required a block of steel weighing 47 pounds. The same cylinder could be made from about 27 pounds of steel in the form of a cheap casting.

"Of course there has been an outcry against the misunderstood and hitherto unsatisfactory casting — unsatisfactory because of structural weakness in the metal. The aircraft industry did not understand the new whirling methods for making sound and well-knit castings. The army and navy experts protested loudly. But Sorensen of the Ford company went right ahead and made some test cylinders.

"To the amazement of the aircraft industry experts, the Sorensen cast cylinders stood far greater stresses and strains than the costly forged cylinders."

—□—

Dun & Bradstreet Inc., 290 Broadway, New York, is undertaking a survey of manufacturers dealing with defense production. Information to be gained from this survey should be of considerable value both to industry and government, therefore it is suggested that those receiving blanks return them as soon as possible.

—□—

A note from W. D. Bailey Jr., secretary of the Southern California Chapter of the A.F.A., tells that the annual December party of the chapter was cancelled because of war conditions and blackouts.

—□—

Recognizing the need for definite information regarding the protection of foundries from air raids, fire, and sabotage, the American Foundrymen's Association has assigned the task of preparing such plans to its Industrial Hygiene Codes Committee under the chairmanship of James R. Allan, International Harvester Co., Chicago. The committee is working in co-operation with the Office of Civilian Defense.

Along this same line, several manufacturers of equipment now have developed satisfactory means for blacking out the cupola.

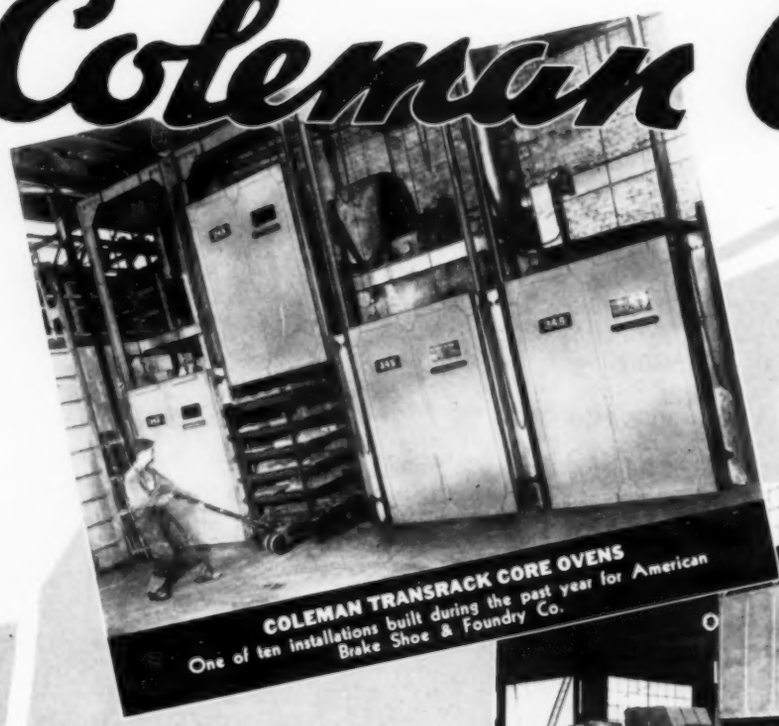
—□—

Early last March, upon becoming connected with the Tools and Equipment Branch of the OPM, I was directed to share an office in the Social Security building with four other men who were engaged in other phases of the production problem. Working with these men was indeed a pleasure and a privilege, and I sincerely hope that the friendships established will carry on for many years. To Sydney Buckley, William T. McCargo, Myron N. Smith and Bradley Stoughton, thanks for everything and the best of luck as you carry on in Washington.

F. G. S.

Coleman Ovens

35 Years' Experience



COLEMAN TRANSRACK CORE OVENS
One of ten installations built during the past year for American Brake Shoe & Foundry Co.

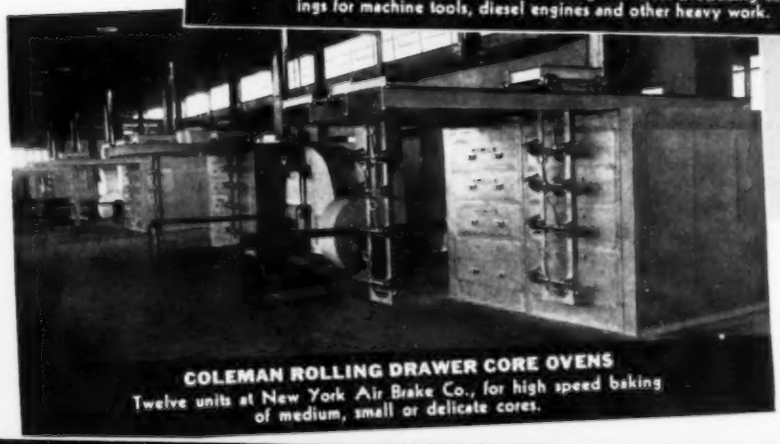
COLEMAN CAR TYPE CORE OVENS
Recent installations include many leading foundries producing castings for machine tools, diesel engines and other heavy work.

COLEMAN OVENS

Built in the following types—and for any fuel.

- PORTABLE
- ROLLING DRAWER
- TRANSRACK
- TOWER
- CAR
- HORIZONTAL CONVEYOR

Write for catalog



COLEMAN ROLLING DRAWER CORE OVENS
Twelve units at New York Air Brake Co., for high speed baking of medium, small or delicate cores.

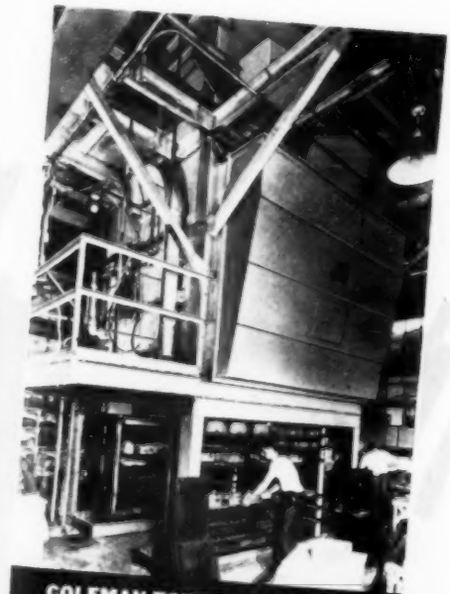
Coleman CORE

Boost WAR Production

BETTER CORE BAKING

BETTER MOLD DRYING

...50 to 75% Faster



COLEMAN TOWER CORE OVENS
Typical of many installations recently made in grey iron, malleable and steel foundries.

OVER 6,000 INSTALLATIONS - - This extensive experience back of Coleman Core and Mold Ovens guarantees fast, dependable and economical production to meet all conditions and emergencies.

Coleman Ovens are the outstanding choice of AMERICA'S LEADING FOUNDRIES because they insure perfect core baking and mold drying.

Whatever your conditions and needs may be, there is a Coleman Oven of a correct type and size to help you best meet your war production program.

THE FOUNDRY EQUIPMENT CO.
BUILDERS OF COLEMAN AND SWARTWOUT OVENS
CONTRACTING ENGINEERS AND MANUFACTURERS
CLEVELAND, OHIO

and MOLD OVENS

Activities of FOUNDRY GROUPS

N. Ill.-S. Wis.

ABOUT 300 or more foundrymen and guests were present at Hotel Faust, Rockford, Ill., when the Northern Illinois-Southern Wisconsin Chapter of the A. F. A. held its annual Christmas party in the grand ballroom on Dec. 5. The evening was a huge success—featuring an excellent floor show and chicken dinner with all the trimmings—*J. R. Cochran, technical secretary.*

Conn. Nonferrous

DISCUSSION of copper order M-9-c by Edwin L. Howard, district manager, Hartford, Conn., office of the Priorities Field Service of OPM and George Krell of the same office, featured the Dec. 17 meeting of the Connecticut Nonferrous Foundrymen's Association, held at the Union League Club, New Haven, Conn., and which attracted one of the largest attendances of the association. After a preliminary talk, the meeting was turned into a general discussion and many members went away with many questions regarding the M-9-c copper order cleared up, as well as with the knowledge of the willingness of the Priorities Field Service to assist the business man with the various priorities problems.

The nominating committee headed by Charles A. H. Knapp presented the following slate of officers which were elected to serve for 1942: President, Ernest F. Stone, Manning, Maxwell & Moore Co., Bridgeport, Conn.; vice president, Walter J. Kenney, North & Judd Mfg. Co., New Britain, Conn.; treasurer, S. W. Chappell Sr., Electric Boat Co., Groton, Conn.; secretary, Louis G. Tarantino, Niagara Falls Smelting & Refining Corp., Bridgeport, Conn.; technical secretary, Frank B. Diana, Whipple & Choate Co., Bridgeport. Executive committee: Chairman, D. Wesley Case, Belknap Mfg. Co., Bridgeport; Howard A. Phelps, Phelps Foundry Co., Ansonia, Conn.; T. Joseph Judge, Jenkins Bros., Inc., Bridgeport; George S. King, Malleable Iron Fittings Co., Branford, Conn.; and Fred B. Clarke, Whitehead Bros., Providence, R. I.

February meeting of the association will be held at the Union League Club, New Haven, Conn. on Feb. 16. —*Louis G. Tarantino, secretary.*

Western N. Y.

MORE than 100 members and guests were present for dinner at the Dec. 5 meeting of the Western New York Chapter, with added guests present for the business session that followed. Thomas J. O'Rourke, manager of the contract distribution division of OPM gave an interesting and instructive talk on how foundries can render the maximum co-operation in the defense effort and at the same time benefit themselves by fuller participation in defense activity. C. A. Barnett, Foundry Equipment Co., Cleveland, made the foundry talk of the evening and his subject was, "Core Baking and Mold Drying," with which he has had more than 25 years specialized experience. Mr. Barnett's talk, following the study at the November meeting of core making and molding machines was most timely and the question and answer period extended for well over an hour.—*Eliot Armstrong, secretary.*

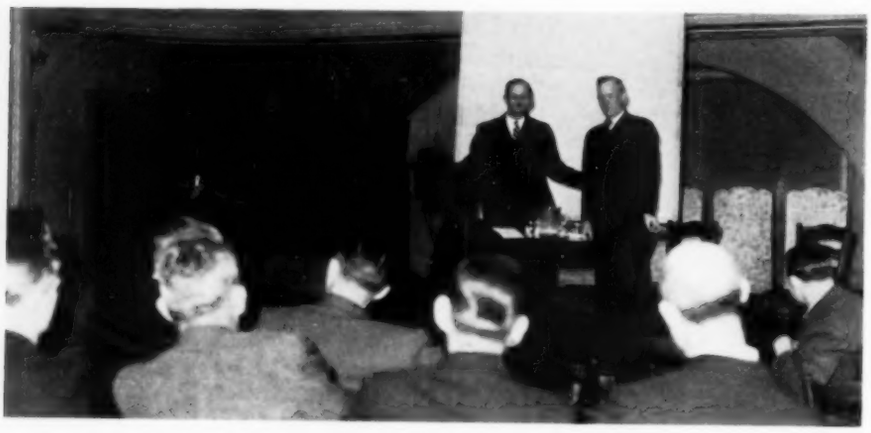
Western Mich.

REGULAR monthly meeting of the Western Michigan Chapter was held Jan. 5, at the Occidental Hotel, Muskegon, Mich., with about 50 foundrymen in attendance. The presiding officer, due to the absence of Chairman Seyferth, was C. J. Lonee, Muskegon Piston Ring Co., Sparta division, and vice chairman of the chapter.

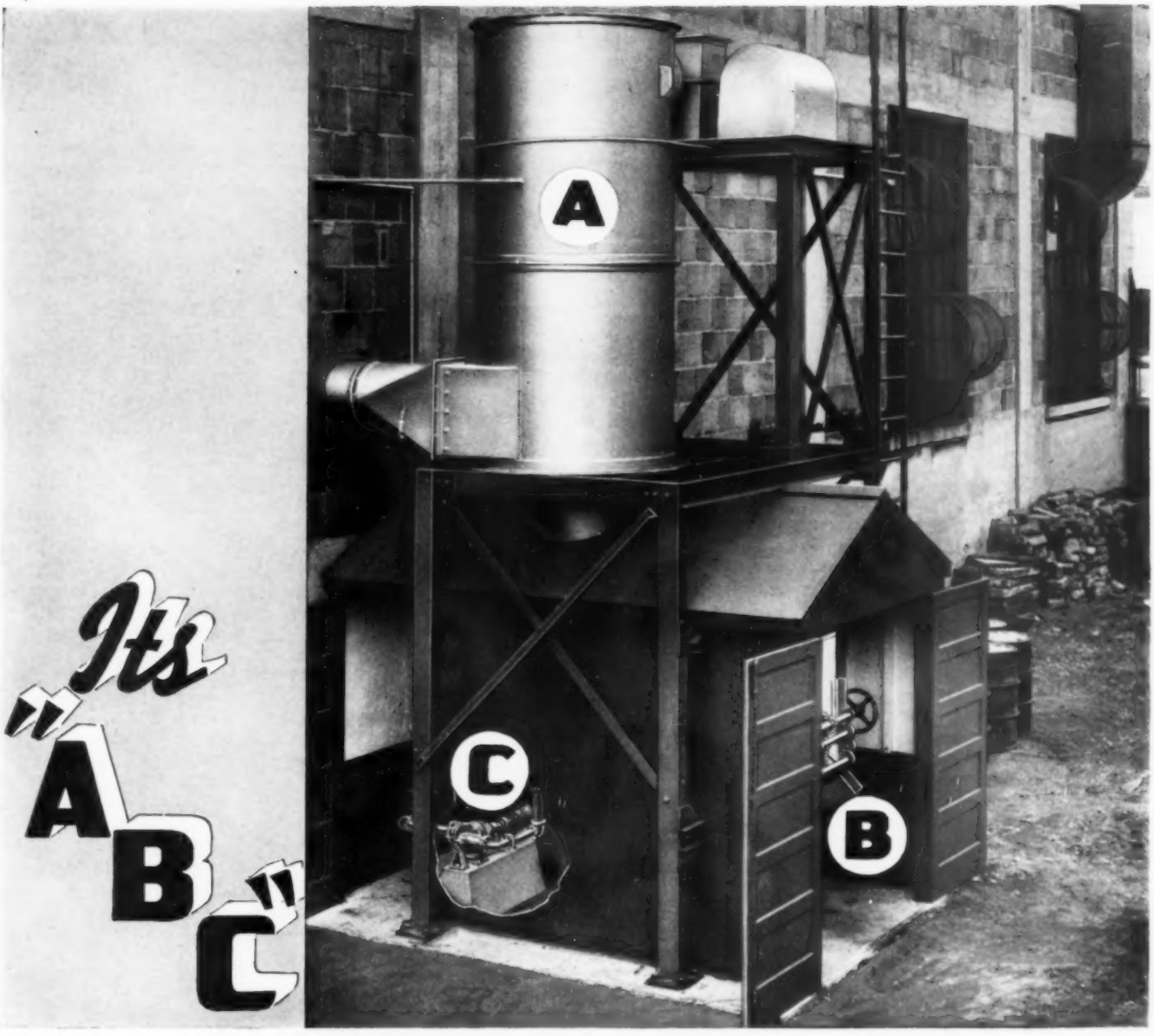
The speaker of the evening, Earl Woodliff, Harry W. Dietert Co., Detroit, gave an interesting and informative talk on molding sand problems. Mr. Woodliff emphasized that the man selected for routine testing of sand should have foresight and be able to anticipate coming troubles before they actually arrive. An interesting statement made by the speaker was the proven fact that fines do not accumulate but are almost entirely present in the new sand before going into use. He also cautioned foundrymen not to try to change sand properties too rapidly, but rather to make small changes daily, and that by making complete physical tests on new sands coming in, it is possible to predict probable results and compensate accordingly.

Following the question period. A. E. Jacobson, Grand Haven Brass Foundry, showed kodachrome movies of a trip taken by him through the Caribbean islands to Dutch Guinea and Venezuela. He also was asked many questions not

(*Continued on page* 94)



At the Birmingham Chapter's apprentice meeting held on Dec. 12 at the Tutwiler hotel T. H. Benners Jr. introduced Herbert Farr, Russel Mfg. Co., Alexander City, Ala., who spoke on pattern design



Its "A B C"

SIMPLICITY
ELIMINATES MAINTENANCE WORRIES!

There's nothing complicated about the Schneible Multi-Wash Dust and Fume Collection System whatsoever—that's why operating cost is low and why no attention is required, freeing workmen for important jobs.

The Schneible has nothing to break, burn, replace or adjust. No dry dust hoppers to empty manually. It consists of: (A) A collector through which dirty air is drawn where it undergoes a thorough washing process involving only natural forces—nothing mechanical or electrical. Ordinary water is used over and over again as the cleansing medium.

(B) Dust washed from the air becomes sludge and is dewatered in a tank. Harmless sludge is disposed of after sufficient accumulation, by hauling, gravity or pumping it away. (C) Clear water from the dewatering tank is recirculated by the Schneible "Wear-Proof" Pump to the collector.

There is no method that comes even close to the Schneible for low operating and maintenance cost. The numerous installations in outstanding foundries give proof of their efficiency. May we send complete details?

CLAUDE B. SCHNEIBLE COMPANY
3953 Lawrence Avenue, Chicago, Illinois
Offices in Principal Cities

SCHNEIBLE

(*Continued from page* 92)
pertaining to the foundry industry, however.

Next meeting of the chapter will be held on Feb. 2, Rowe Hotel, Grand Rapids, Mich., with the foundrymen in that vicinity arranging the program. Edwin C. Barringer, executive secretary of the Institute of Scrap Iron and Steel will be the principal speaker and the remainder of the program is to be announced later.—*Max A. Amos, secretary-treasurer.*

Central Indiana

A TOTAL of 90 members and guests were present at the Jan. 5 meeting of the Central Indiana Chapter held at the Washington Hotel, Indianapolis. H. B. Harvey, Indiana Foundry Co., Muncie, Ind., and chairman of the chapter presided, and I. R. Wagner, Electric Steel Casting Co., Indianapolis, acted as discussion leader.

Principal speaker was Charles P. Jones, general superintendent, William H. Block Co., Indianapolis, whose discussion covered, "Personnel Relations." Mr. Jones has had many years experience in personnel relations and discussed the responsibilities of a supervisor, his attitude and ways and means of securing best results. The talk was very practical, and he brought out the fact that all personnel relations were basically the same whatever the industry or business.

Robert E. Kennedy and Duncan P. Forbes were visitors at the meeting, also attending the directors meeting before the regular meeting, and they both talked to the chapter at dinner.

Feb. 2 meeting of the chapter will feature two speakers: C. T. Greenidge, Battelle Memorial Institute whose topic is "Control Tests for Gray Iron," and E. D. Mooney, Federated Metals division, American Smelting & Refining Corp. who will discuss, "Nonferrous Gates and Risers." The meeting will be held at the Washington Hotel, Indianapolis.

First annual Christmas party of the Central Indiana Chapter was held at the Washington Hotel, Indianapolis, Dec. 13. Approximately 100 foundrymen and guests were present. Chairman of the Committee in charge of the party was O. E. Murphy, Hickman, Williams & Co. The party featured a buffet dinner with a floor show and other entertainment.—*R. A. Thompson, secretary.*

Connecticut

THE December meeting of the Connecticut Foundrymen's Association was held at the Home Club, Meriden, Conn. President Robert Mills presided and 44 members were present.

C. E. Andrews, Whitehead Bros. Co., New York, was introduced and gave an outline of the foundation which was made in 1841 by Samuel Whitehead and the progress which has been made in methods of producing, testing, mixing and transporting sands to the foundry industry. A motion picture entitled, "Sand" was shown. The picture illustrated the glaciers breaking down and the gradual movement of silt clays; natural mixing and polishing of the grains of sand by wind and water; formation of sand banks by deposit of the glaciers as the water recedes. Best known sand deposits are Albany, South Amboy and Provincetown. The first sands used in foundry were brought in as ballast on ships from England where the greater portion had been taken from the Thames river.

The meeting was adjourned after a rising vote of thanks to the Whitehead Bros. Co. and Mr. Andrews.—*Henry C. Griggs, secretary.*

Metropolitan

IN ADDRESSING a group of 95 members and guests of the Metropolitan Chapter at its meeting held Jan. 5 at the Essex House, Newark, N. J. on the subject "Nonferrous Pressure Castings," D. Frank O'Connor, division superintendent, Walworth Co., Boston, stated, "Now as never before, it is necessary for the foundry to come into its own. It is unfortunate," he continued, "that the foundry industry does not avail itself of the opportunity to place men with technical training in charge of the actual operations in the foundry. The production of good castings is the direct responsibility of the men in charge of molding, melting, and pouring, and increased attention to these jobs will result in a higher yield of good castings." The speaker related the success of his company in educating the molders and foundry helpers in the requisites of their respective jobs, with a resulting increase in the quality of the castings they helped to produce.

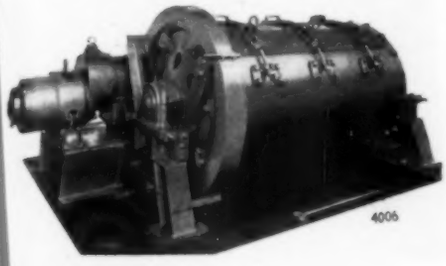
Mr. O'Connor stated their output normally included a number of different nonferrous alloys, and that in all cases they have found it de-

(*Continued on page* 96)

Partial view of those attending the Birmingham Chapter's apprentice meeting held Dec. 12 at the Tutwiler hotel. Speaker Herbert Farr discussed pattern design

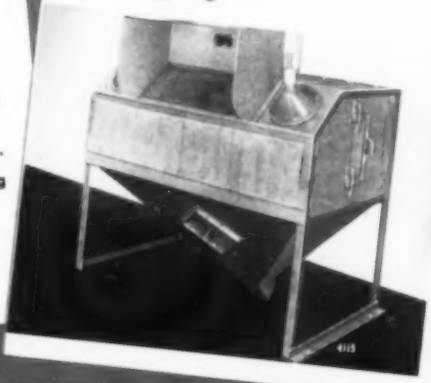
For Cleaning *Faster, Better* and at *Lower Cost*
Choose from the SLY Complete Line of Foundry Cleaning Equipment

SLY TUMBLING MILLS



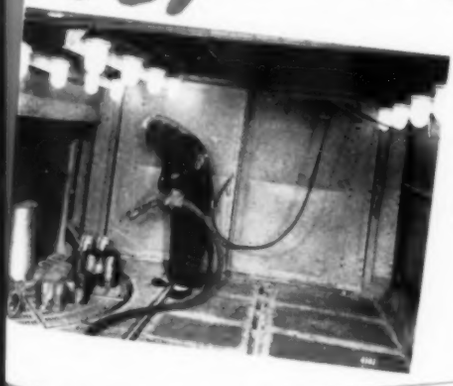
1. Heavy forged steel trunnions, extra heavy roller bearings.
2. Special door locks — easily operated.
3. Extra heavy gearhead motor.
4. Integral motor platform.
5. Loading and unloading from either side.

SLY BLAST CABINETS



1. Two lights mounted at front to illuminate castings.
2. Operator's eyes shielded by protective hood.
3. Easy loading and unloading of castings.
4. Used for thorough cleaning of small and intricate parts, or as an auxiliary to larger units.

SLY BLAST ROOMS



1. Overall down-draft ventilation.
2. Ample illumination.
3. Lined throughout with 3-16" wear plates.
4. Floor of grating and perforated plates.

SLY AIRLESS BLAST CLEANING EQUIPMENT

MILLS AND TABLES

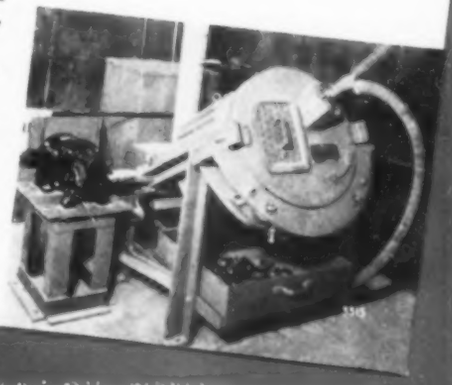
Exclusive wheel features for fast and economical cleaning.

SLY DUST FILTERS

1. More filter cloth—hence greater filtering capacity.
2. Filter bags under tension (patented) insure: (a) minimum resistance to air flow, and (b) complete dust removal.
3. Simpler shaker mechanism—less moving parts, less maintenance.
4. Bags more easily replaced.
5. Automatic control — any degree.

SLY BLAST MILLS

1. Handles quantities of castings, forgings, stampings, hardened steel parts.
2. Tilted barrel with rolling action.
3. Convex perforated bottom plate forms bottom of barrel.
4. Work is constantly turned bringing bottom pieces to top.
5. Stationary head of barrel has large door for loading.



68 YEARS OF SERVICE TO THE FOUNDRY INDUSTRY

THE W. W. SLY MANUFACTURING CO.

4753 TRAIN AVENUE ★ CLEVELAND, OHIO ★

(*Continued from page* 94)

cidedly advantageous to keep daily records regarding sand, melting and pouring conditions. Melting is done in open flame type furnaces which are kept slightly oxidizing. The importance of drying out a furnace after it has been repaired and before it is put back in service was emphasized. Mr. O'Connor indicated that if this precaution is not taken, the result might be as much as two days of gassy castings due to hydrogen. He also stated they preferred not to soak heats at temperature since this too resulted in hydrogen pick-up and blowholes in the castings.

With reference to pouring practice, the need for preheating ladles to a temperature as high as that of the metal was suggested. Refractory ladle liners insulated from the ladle shell by ½-inch insulation, reduces the metal temperature loss during pouring from as much as 100 degrees Fahr., using a clay lining to about 10 to 10 to 40 degrees Fahr. The use of charcoal in the ladle to prevent oxidation is satisfactory, but it is important that the charcoal is absolutely dry. Mr. O'Connor recommended a pouring temperature range of 2150 to 2250 degrees Fahr. for light and medium castings, and 2100 degrees Fahr. for heavy castings.

In regard to molding practice, the speaker indicated his organization attempts to use as small a gate as possible, for it has been found this practice gives the cleanest castings. The normal practice is to gate into the light end of the casting and feed the heavy end. They attempt to keep the sand at approximately room temperature using as little moisture and having as high a permeability as possible. The necessity of using only clean sand was stressed as highly essential.

In the discussion which was under the technical chairmanship of Dr. N. E. Woldman, chapter chairman, M. O'Connor stated his preference for the use of controlled pouring temperatures rather than risers to obtain sound castings. He did not look with favor upon peening castings to close small leaks, pointing out that it was not good practice and was unacceptable from the standpoint of U. S. Navy specifications. Likewise, the practice of impregnating castings with water glass or shellac was not recommended. With reference to a question concerning the proper temperature for molding sand, Mr. O'Connor pointed out that he has found sand as cold as 40 degrees Fahr. to give trouble with gassy castings—trouble which was eliminated by increasing the sand temperature to 70 degrees Fahr. He indicated that 90 degrees Fahr. might be considered the maximum sand temperature for a day when the room temperature was 75 degrees Fahr.

The high quality of Mr. O'Connor's talk was apparent from the tone and length of the discussion following it. The group was very much interested in examining a number of castings demonstrating various types of defects which Mr. O'Connor displayed.

The next meeting was announced for Feb. 2, at which time H. D. Phillips, Lebanon Steel Foundry Co., Lebanon, Pa., will speak on "Significant Developments in the Steel Foundry Industry During Recent Years." The regional conference sponsored by the Philadelphia, Chesapeake and Metropolitan Chapters will be a one-day session at the University of Pennsylvania, Philadelphia, Saturday, March 28.—*K. A. DeLonge, secretary.*

Philadelphia

NONFERROUS night was observed by the Philadelphia Chapter at its January meeting, held Jan. 9 at the Engineers Club. Dinner was served to approximately 175 members and friends of the chapter. Chairman Harry Reitinger, U. S. Pipe & Foundry Co., presided. The after-dinner speaker Dr. Phillip J. Steinmetz, rector of St. Pauls Church, Elkins Park, Pa., gave a very interesting and inspiring talk, "Common Sense and Courage."

The technical session was devoted to a discussion of nonferrous problems. Edwin W. Horlebein, Gibson & Kirk Co., Baltimore, and chairman of the Chesapeake Chapter, was technical chairman of the session and he introduced the main speaker, D. Frank O'Connor, divisional superintendent of the Walworth Co., Boston.

Mr. O'Connor spoke on "Defects in Pressure Castings," dealing principally with red brass alloys. Various causes of porosity found in nonferrous castings were discussed in detail and remedies suggested for the prevention of the defects. With the aid of numerous samples of defective castings, Mr. O'Connor traced the causes of porosity to various sources such as core sand, melting methods, ladles, oxides, etc. The speaker also stressed the need of proper supervision and control of pouring temperature and molding technique. The meeting proved to be one of the most interesting and instructive sessions ever held by the Philadelphia Chapter.

One of the most successful par-

(*Continued on page* 99)

Good fellowship reigned at Philadelphia Chapter's annual Christmas party held at the Philadelphia hotel on Dec. 17. Over 500 members and guests attended

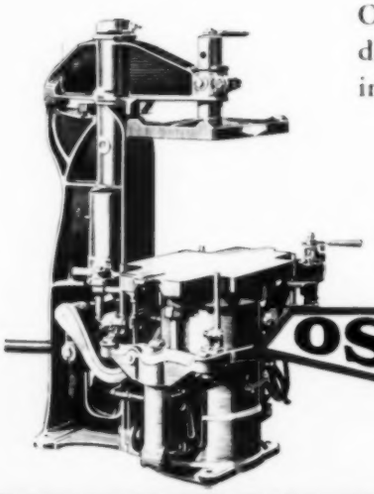
FRANKLIN G. SMITH
President of The Osborn Manufacturing Company since 1892

One President and One Policy for 50 Years

★ Osborn has enjoyed the vigorous leadership of one man for the past 50 years—its founder and president, Franklin G. Smith. In 1892 he established the policy that every product bearing the Osborn name should not only be of the highest quality but should be sold and serviced in a manner to insure the greatest value to the customer.

The foundry industry has had ample opportunity to judge the effectiveness of this policy. During the early years Osborn's line consisted of brushes and other essential foundry supplies. In 1909 the first Osborn moulding machine was introduced and from that single unit has grown a complete line of modern moulding and core blowing machines which today enjoys world-wide acceptance. And, in line with the policy established, Osborn has developed a sales and service organization whose primary task is to help you get a maximum return on your equipment investment.

It is because of Franklin Smith's farsightedness that 1942 finds Osborn in a position of leadership to aid the foundry industry in its drive toward new, all-time high production records. The biggest job in our 50-year history lies ahead and we approach it with confidence.



THE OSBORN MANUFACTURING COMPANY
5401 Hamilton Avenue • *Cleveland, Ohio*

OSBORN
MOULDING MACHINES

OSBORN JOLT SQUEEZER OSBORN JOLT STRIPPER OSBORN
OSBORN JOLT ROLLOVER PATTERN DRAW OSBORN
PLAIN JOLT PLAIN JOLT
CORE ROLLO
CORE BLO MACHINES
VIBRAT
ROLLOVE
SAND
JOLT
PLAIN JOLT
JOLT ST SQUEEZER
SAND DRAW
ROLLOVER CORE ROLLOVER CORE
JOLT SQUEEZE STRIPPER
JOLT ROLLOVER SQUEEZE PATTERN DRAW
VIBRATORS AND ACCESSORIES
CORE BLOWING MACHINES
EQUIPMENT

OSBORN

MOULDING MACHINES

THE OSBORN MANUFACTURING COMPANY

5401 HAMILTON AVENUE CLEVELAND, OHIO

(*Continued from page* 96)

ties in the history of the chapter took place at the Philadelphia hotel, Dec. 17. Over 500 members and friends of the chapter attended its annual Christmas party and partook of a delicious turkey dinner, for which the hotel is famous. The ball room of the hotel was arranged as a night club with tables seating 10 people. After dinner, the floor show arranged by the entertainment committee, headed by John L. Robb, Hickman, Williams & Co., proved to be one of the best. The party was a great success and will be remembered as one of the high lights of the Philadelphia Chapter's activities. Photographs taken during the course of the festivities are shown on page 96 of this issue.

Radiographic inspection will be the subject covered by Prof. Gilbert E. Doan, Lehigh University, Bethlehem, Pa., at the Feb. 13 meeting of the chapter.—*B. H. Bartells, chairman, publicity committee.*

Wisconsin

ANNUAL Christmas party of the Wisconsin Chapter was held Friday, Dec. 19, in the crystal ballroom, Hotel Schroeder, Milwaukee. Nels Spidell, Sand Products Co., Milwaukee, and chairman of the Christmas party committee reports that 748 members and guests were present to enjoy the festivities. Other members of the committee were: R. A. Smith, Sterling Wheelbarrow Co., Marvin Knoller, Electro Refractories & Alloys Co., John Bing, A. P. Green Fire Brick Co., and Joe Wesley, Wesley Steel Treating Co., Milwaukee.

A splendid dinner put on with excellent showmanship by the hotel staff was followed by a floor show of unusual caliber. One of the features of the show was a characterization of a molder on Saturday night, which kept the crowd roaring as each familiar action was presented. All credit must go to the committee for its excellent work. A. C. Ziebell, chairman of the chapter openly extended his congratulations to them at the close of the party.—*George K. Dreher, secretary.*

Detroit

WITH no meeting scheduled for December, the Detroit chapter reconvened Jan. 15 after the highly successful meeting at the Pontiac Motor foundry; a crowd of about 100 being on hand to hear O. F. Carpenter, foundry superintendent, Packard Motor Car Co. discuss operations in the Packard foundry.

Mr. Carpenter, with his assistants, William Rogers and James Parks, presented a series of lantern slides depicting various phases of foundry operations, and discussed several innovations which he and his engineers have worked out for more efficient production in a plant which normally produces 500 tons of iron per 8-hour shift.

Because of wartime restrictions, the meeting could not be held at

Wisconsin Chapter's annual Christmas party held in the Crystal ballroom of Hotel Schroeder was attended by 748 members and guests according to the tally. Photos courtesy John Bing, A. P. Green Fire Brick Co., Milwaukee

the Packard plant, so was arranged for Huyler's Men's Grille in the Fisher Bldg.

A lively question and answer period added much to Mr. Carpenter's discussion of unusual techniques practiced at his plant.—*A. H. Allen, secretary*

St. Louis

LARGEST and finest Christmas party in the history of the St. Louis District Chapter was held Thursday, Dec. 11. Nearly 400 foundrymen and friends attended the dinner and party which was held at the DeSoto Hotel in St. Louis. Long recognized as the real event of the year as far as the social phase of St. Louis chapter work is concerned, this one really *topped* all others.

Upon entering the banquet hall which had been decorated especially for the occasion, the members were greeted by strolling musicians playing any and all favorite numbers. This feature was especially entertaining. Following a period of refreshments and visiting, a fine steak dinner was served. Entertainment feature of the evening was a stag show, over two hours long, entertaining the group royally.

All in all it was a great evening and a fine tribute to the work done by the entertainment committee chairman, Russell Hard, and his two assistants, Harold Wiese and Bill McKee.

Considering very inclement weather, the Jan. 8 meeting of the St. Louis District Chapter was well attended. Following refreshments and dinner, the customary business session was held under the chairmanship of Chapter Chairman Carl Morken. Reports of various committees were then given. Of special interest was the report by L. Kleber, chairman of the apprentice training committee who outlined in some detail plans for the apprentice training contest to be held in connection with the national contest at Cleveland in April.

Recognition of several visitors was made following which Louis Desparois, chairman of the program committee, directed attention to the February meeting which would be held on Friday, Feb. 13, instead of the usual night. That was done to make possible a joint meeting with the Steel Founders' Society.

This being a round table discussion evening, the meeting then broke up into various division with leaders and speakers as follows: The steel group considered "Melting of Steel in Electric Furnace and Open Hearth" with D. B. Reeder, Electro Metallurgical Sales Co., Chicago as speaker and F. B. Riggan, Key Co., East St. Louis as discussion leader; gray iron section met with Carl H. Morken, Carondelet Foundry Co., St. Louis as discussion leader, and John Lowe, Battelle Memorial Institute, Columbus, O. discussed "Cupola Practice"; nonferrous members of the chapter had as their speaker E. D. Mooney, Federated Metals division, American Smelting & Refining Co., Whiting, Ind., with Francis O'Hare, Central Brass & Aluminum Co., St. Louis as discussion leader. The various round table discussions were well attended and splendidly led.—*J. W. Kelin, secretary-treasurer.*

N. California

NORTHERN California Chapter held its first meeting of 1942, Jan. 9, at the Alexander Hamilton hotel, San Francisco, with an attendance of 47. Although not as many as usually attend, in reality the turnout was good when recent blackout experiences and the possibilities of being marooned miles

(*Continued on page* 102)

A splendid dinner and excellent floor show were enjoyed by the 748 members and guests who attended the annual Christmas party of the Wisconsin Chapter held on Dec. 19 at Hotel Schroeder. Photos courtesy John Bing, A. P. Green Fire Brick Co., Milwaukee

Plan on this
IMPORTANT COMBINATION

These two big issues of The FOUNDRY are published in conjunction with the Western Hemisphere Foundry Congress (46th annual A. F. A. Convention and Exhibit). Plan to use their specific marketing values.

INTERESTED foundrymen buyers will index these issues closely. They will earmark equipment and supplies for immediate and future purchases. To present advertisers, The Pre and Post-Convention issues of *The FOUNDRY* constitute an outstanding opportunity to more aggressively create interest among foundry management and production men.

To new advertisers, these two issues combine as a starting gun for a sustained program throughout the year.

The Pre and Post-Convention issues are a convention in themselves. They are read by foundrymen who influence purchases . . . foundrymen who are influenced by what they read in *The FOUNDRY*. Reserve your advertising space NOW.

NOTE—A.F.A. CONVENTION WILL BE HELD FROM APRIL 20-24 INCLUSIVE

The Foundry

ADVERTISING DEPARTMENT · PENTON BUILDING · CLEVELAND

(*Continued from page* 100)

from home for an unknown period are considered.

The new coat cards were appreciated. Only one man forgot the number assigned him on his meeting notice. Report of the membership drive was made, with one man signing up and two requests for applications received. Several announcements including the A.F.A. convention and exhibit were made before E. M. Welch, chairman of the chapter, turned the meeting over to James L. Francis, program chairman, who introduced R. E. Brown, Electro Metallurgical Sales Corp., principal speaker.

Bob Brown knew personally 90 per cent of the audience. His explanation of what to do in the trying times of urgent demand for increased production of first class castings from some poor and generally scarce material was attentively listened to. His talk on "Ladle Additions of Alloys in Gray Iron Castings" brought up many questions, all of which he answered with satisfaction.

San Francisco office of the Federal Bureau of Investigation kindly complied with the request of the Northern California Chapter and assigned H. C. Van Pelt to speak to a group of members and guests at the chapter's Dec. 5 meeting held at the Lake Merritt Hotel, Oakland, Calif. S. D. Russell, Phoenix Iron Works, Oakland, and a past chairman of the chapter, conducted the meeting. Before introducing the speaker he summarized the activities of the chapter's various committees. Special emphasis was placed on the membership drive, stressing the importance of contacting every prospect.

Everyone present had at least some vague knowledge of the activities of the FBI, but after having listened for over an hour to Mr. Van Pelt, each one was better informed. Some of the super-human stunts were discredited. However, it was learned that the FBI attends to many details of which the ordinary citizen takes little or no thought.

(*Continued on page* 104)

Members and guests of the Pittsburgh Foundrymen's Association enjoyed a good time at the annual Christmas party which was held Dec. 15. Photos courtesy Sterling Farmer, Sand Products Corp., Cleveland, and R. L. Hartford, Pittsburgh

CHARGING THE *Modern* WAY *for* VICTORY

Cupolas — Cupola Chargers — Covered & Insulated Ladles — Lifetime Geared Ladles —
Improved Bottom Pour Ladles — Metal Pouring Systems — Crane & Monorail Systems
For Metal & Mold Handling — Furnace Charging Cranes — Electric Mold Skin Driers

MODERN EQUIPMENT COMPANY

PORT WASHINGTON, WISCONSIN

MODERN EQUIPMENT CO.
PORT WASHINGTON, WIS.
DEPT. 187

(*Continued from page* 102)

Because of world conditions it was quite to the point that Mr. Van Pelt stressed the importance of being on guard; to take notice of and immediately report to the FBI office such information as would help them in its business of protecting individual and national safety.

In the light of what happened Dec. 7, his message was prophetic and crystalizes the necessity for every American to be on his toes to detect and report everything that tends to undermine our national security.—*George L. Kennard, secretary-treasurer.*

N.E. Ohio

IN SPITE of below zero temperature over 100 were present at the regular meeting of the Northeastern Ohio Chapter held at the Cleveland Club on Jan. 8. President Frank J. Dost presided, and he stated that all committees for the forthcoming annual convention and exhibition of the American Foundrymen's Association had been appointed. He also requested that all members work actively with their committees to insure an outstanding success.

Main speaker of the evening was Earl L. Shaner, president, Penton Publishing Co., and editor-in-chief of *Steel* who discussed, "The Foundry Industry in War Time." He reviewed America's preparation for war from 1933 to Dec. 7, 1941, when Pearl Harbor was attacked. He pointed out that the United States in company with other democratic nations watched Hitler's preparations with a complacency that is embarrassing in retrospect. While Hitler was mobilizing every resource for conquest, the government of the United States not only was discouraging private enterprise, condemning the machines as an economic and social menace, and fanning the flames of a dangerous class feud, but it also was sending valuable equipment, materials and supplies to our potential enemies.

Thus we entered war under severe handicaps. However, there is no point, he said, in wasting time now in recriminations over past mistakes. The thing to do, he advised, is to wipe the slate clean as of Pearl Harbor. Consider the period from Dec. 7, 1941 to Jan. 6, 1942 as a month of disillusionment—a month in which the American people reexamined themselves and oriented their thinking to the real problems of actual war. Judge each man on the basis of his deeds henceforth.

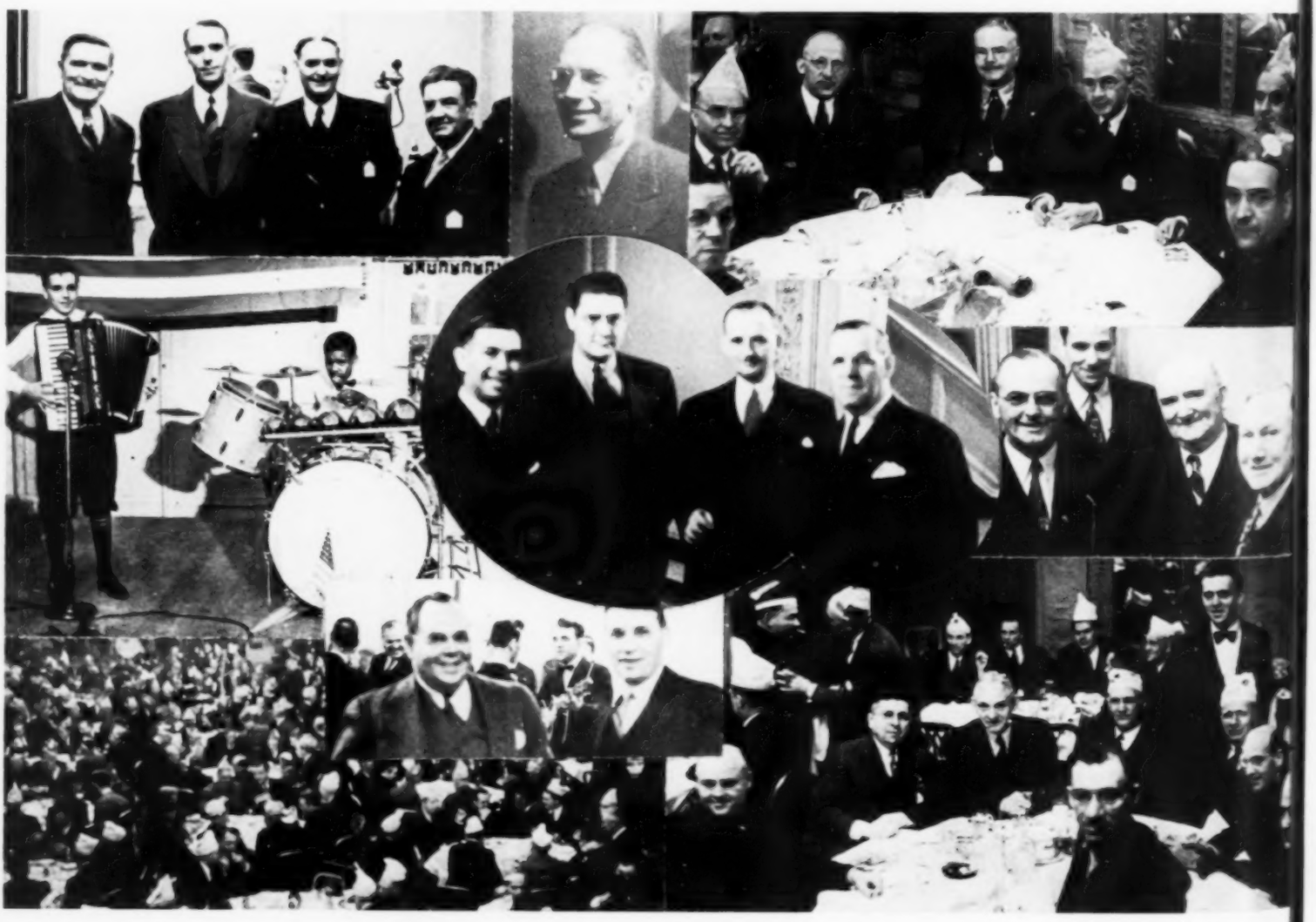
The pattern for America's war effort will be based on the quotas for production set forth by the President in his message to Congress on Jan. 6. To make 60,000 planes, 45,000 tanks, 20,000 antiaircraft guns and 8,000,000 tons of merchant ships in 1942 is a tremendous undertaking. Yet no responsible person has called it impossible. Everybody is confident it can be done if the spirit is right.

The American foundry industry will play an important part in this program. It is in a far better position to contribute to the war effort than it was in 1917 and 1918. While there are about 1100 fewer foundries in the United States today than during the first World war, the present foundries are larger, better equipped and better staffed, declared Mr. Shaner.

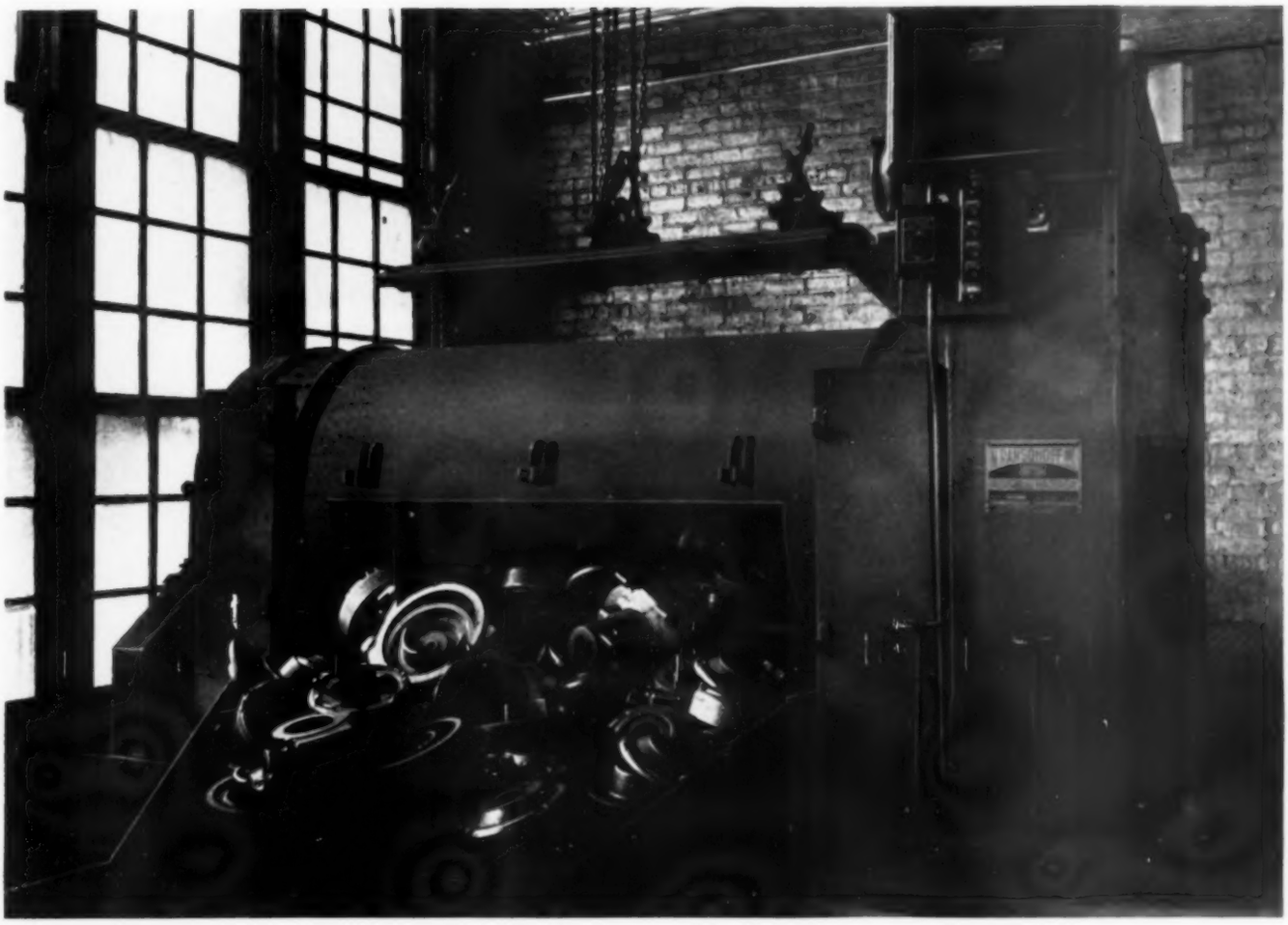
He also pointed out that the qual-

(*Continued on page* 107)

Pittsburgh Foundrymen's Association held its annual Christmas party on Dec. 15 with an excellent attendance. Center inset shows left to right—W. H. Satterfield, vice president of the group; R. L. Hartford, program chairman; C. H. Paul, secretary-treasurer, and C. J. Scheckhaus, president. Photos courtesy Sterling Farmer, Sand Products Corp., Cleveland, and R. L. Hartford, Pittsburgh



SAVE TIME ..LABOR ...MAINTENANCE



Increase production, and get a more uniformly superior finish on all castings with Ransohoff Star Return Mills.

You too, can get the same efficiency as Pyle-National of Chicago. They eliminated sand blasting and cut cleaning costs 66% with a Ransohoff Star Return Mill.

A tank equipped with pump sends a hot basic solution through the mill to wash away sand and scale as they are removed from castings.

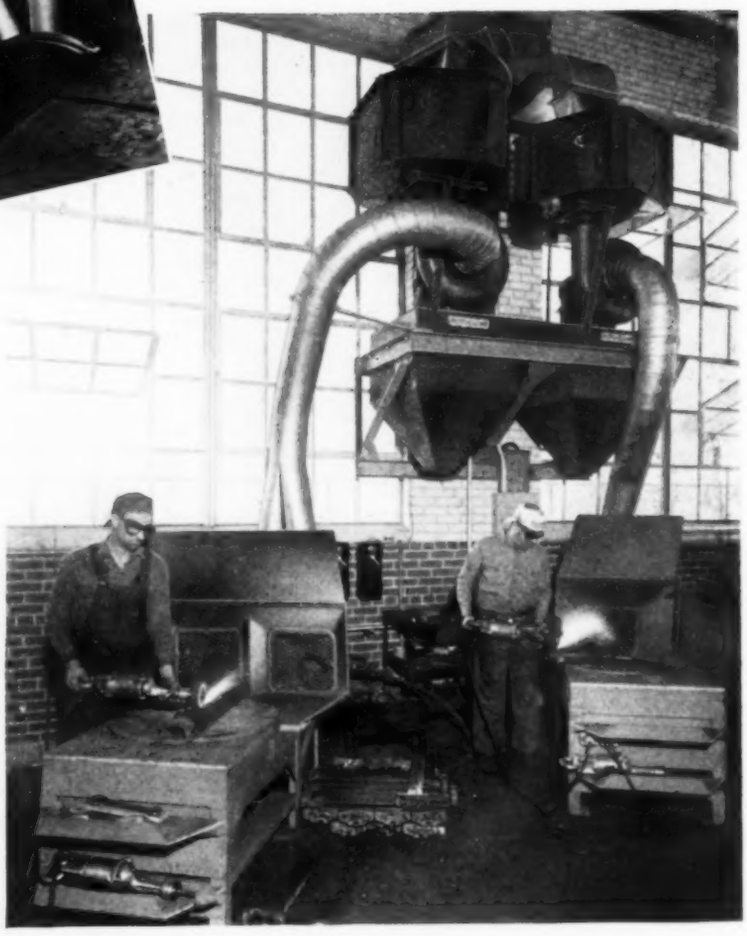
Wet milling removes the dust at its source. An excess amount of stars insures a more thorough cleaning, which only Ransohoff Equipment gives.

Write or wire Dept. "F" for catalog or further information.

N. RANSOHOFF, INC. CINCINNATI, OHIO

210 TOWNSHIP AVENUE—ELMWOOD PLACE

The Cincinnati Shaper Co. *uses* ROTO-CLONE *for Portable Grinder* DUST CONTROL



Dust, created by portable grinders in the Cincinnati Shaper Company's finishing rooms is collected by batteries of Type D Roto-Clones. The exhaust systems were installed by Kirk & Blum who used both overhead and under floor ducts for collecting the fine floating dust from the grinding and finishing operations.

After being cleaned, the exhausted air may be returned to the work rooms through AAF high efficiency Viscous Filter After Cleaners mounted on top of the Roto-Clone units . . or it may be exhausted directly to the outside, depending upon the temperature desired.

Write for Type D Roto-Clone Bulletin (covering dry dust collection) No. 272, and Type W Roto-Clone (wet collection) No. 274-A.

AAF **AMERICAN AIR FILTER CO., INC.,** 264 Central Ave., LOUISVILLE, KY.
IN CANADA: Darling Bros., Ltd., MONTREAL, P. Q.

ROTO-CLONE *Dust Control*

ENGINEERED TO YOUR REQUIREMENTS BY THE AMERICAN AIR FILTER CO.

(*Continued from page* 104)

ity of castings has improved to a marked extent since the last war. For instance, in 1918 gray iron foundrymen thought they were doing well to meet the specifications for tensile strengths of 18,000 pounds per square inch for light castings, 21,000 pounds for medium and 24,000 pounds for heavy castings. Today foundrymen make castings in seven classifications in which the tensile strengths range from 20,000 to 60,000 pounds.

Malleable foundrymen were working to a 38,000-pound minimum tensile strength at the beginning of World War I and to 45,000 pounds just before the armistice. Today specifications in two classifications call for minimums of 50,000 and 53,000 pounds tensile strength.

In plain carbon steel castings the tensile strengths have not changed appreciably. However, during the first World war most castings were used in the as-cast state, whereas today most are normalized or fully annealed.

In all types of castings, uniformity of quality is more easily attained than in 1917-18. Also, through the more extensive use of alloys, castings can be furnished to meet an unprecedented number of applications.

Mr. Shaner stated that while it is the duty of every foundry to get into war production to the greatest extent possible, it is also important that the foundries, working collectively through their trade and technical associations should attempt to impress Washington with the foundry industry's capacity to serve.

The foundry industry's opportunity to contribute to victory in the war will depend in part, he said, upon the degree in which the foundry industry "sells" its prestige and importance to the human beings in Washington who are directing the war production program. One method of attaining the desired result is the forthcoming convention and exhibition of the A.F.A. to be held in Cleveland during April 20 to 24 since it will advertise to the public and government officials what the industry can do to aid in winning the war.

In 1918 the foundry industry was recognized signally by government and public alike for its efforts through the launching of the ship AFOUNDRIA. Consequently, what has been done, can be done again—more so in view of the great progress of the industry.

Following Mr. Shaner's talk, an excellent color, sound-motion picture entitled, "Song of a City" was shown to the group through the courtesy of the Cleveland Trust Co. It depicted the industrial and cultural activities of greater Cleveland, and was enjoyed greatly by those present. Photography and sound effects were all that could be desired.—*Edwin Bremer, chairman publicity committee.*

Nor. Iowa

ANNUAL Christmas party and ladies night of the Northern Iowa Foundrymen's Association was held Dec. 16 at Black's Tea Room, Waterloo, Iowa. Approximately 90 members and their ladies enjoyed a full evening's entertainment consisting of sleight-of-hand performance, sound films and the singing of Christmas carols.

Harold Benz, of the Sloane Wallace Junior High School faculty, presented a 45-minute exhibition of legerdemain that left nothing to be desired. From the enthusiastic applause given Mr. Benz by the foundrymen present, it appeared as though some of them may have thought a few of his tricks might be extremely useful around the foundry. Through the courtesy of the sales department, John Deere Tractor Co., two sound films were shown. The films were highly entertaining and were heartily enjoyed by everyone. Special Christmas music was furnished by Mr. and Mrs. H. Bruns and the singing of Christmas carols and patriotic songs by the entire group completed the evening's entertainpment. —*F. R. Snyder, secretary.*

Shortages Handicap Iron Production

Shortages in raw materials will handicap production of iron and steel in 1942, but output will be more than adequate to meet all demands of the war program, declared Dr. Bradley Stoughton, director of metallurgical engineering and dean emeritus, Lehigh University, Bethlehem, Pa.; chief of the heat treating equipment unit, tool section, OPM; and national president American Society for Metals, in addressing the Chicago Chapter of that society, Jan. 8.

Lack of scrap will restrict steel production to a figure several million tons less than in 1941, and shortage of coke will prevent full use of existing and new blast furnaces to make pig iron. Until new coke ovens can be built and placed in operation, production of pig iron can not be expanded sufficiently to offset lack of scrap in steelmaking.

The speaker pointed out, however, that the deficiencies in steel and iron production will fall entirely within civilian uses, and that all war needs will be fully met. He paid tribute to metallurgists, who through their engineering associations speedily are finding substitutes for vital metals used as alloying elements in steel. He referred particularly to nickel, chromium and tungsten, which are no longer available in adequate amounts to meet present requirements. By disseminating information on production and use of substitute steels, Dr. Stoughton said manufacture of war material is being expedited immeasurably. He expressed greatest confidence that United States war preparations would not fail through any deficiency in metals and metallurgy.

Birmingham To Hold Tenth Conference

Tenth annual foundry practice conference of the Birmingham District Chapter of the American Foundrymen's Association will be held at the Tutwiler hotel, Birmingham, on Thursday and Friday, Feb. 19 and 20. The conference which is the largest foundry gathering of the year in the South, will feature a technical program offering a variety of subjects; an entertainment program on Thursday evening, Feb. 19, and the annual banquet of the conference on Friday evening, Feb. 28. The tentative program follows:

Thursday, Feb. 19

9:00 a.m.—Registration
10:00 a.m.—"Increasing Production in the Foundry with Existing Equipment"
12:30 p.m.—Annual conference luncheon
2:00 p.m.—"Sand and Sand Control"
4:00 p.m.—"Patterns and Patternmaking"
7:30 p.m.—Entertainment. Program under the auspices of the Birmingham District Chapter.

Friday, Feb. 20

Morning—Plant visitation
2:00 p.m.—"Foundry Metallurgy"
4:00 p.m.—Foundry quiz program
7:30 p.m.—Annual conference banquet

Saturday, Feb. 21

Morning—Plant visitation

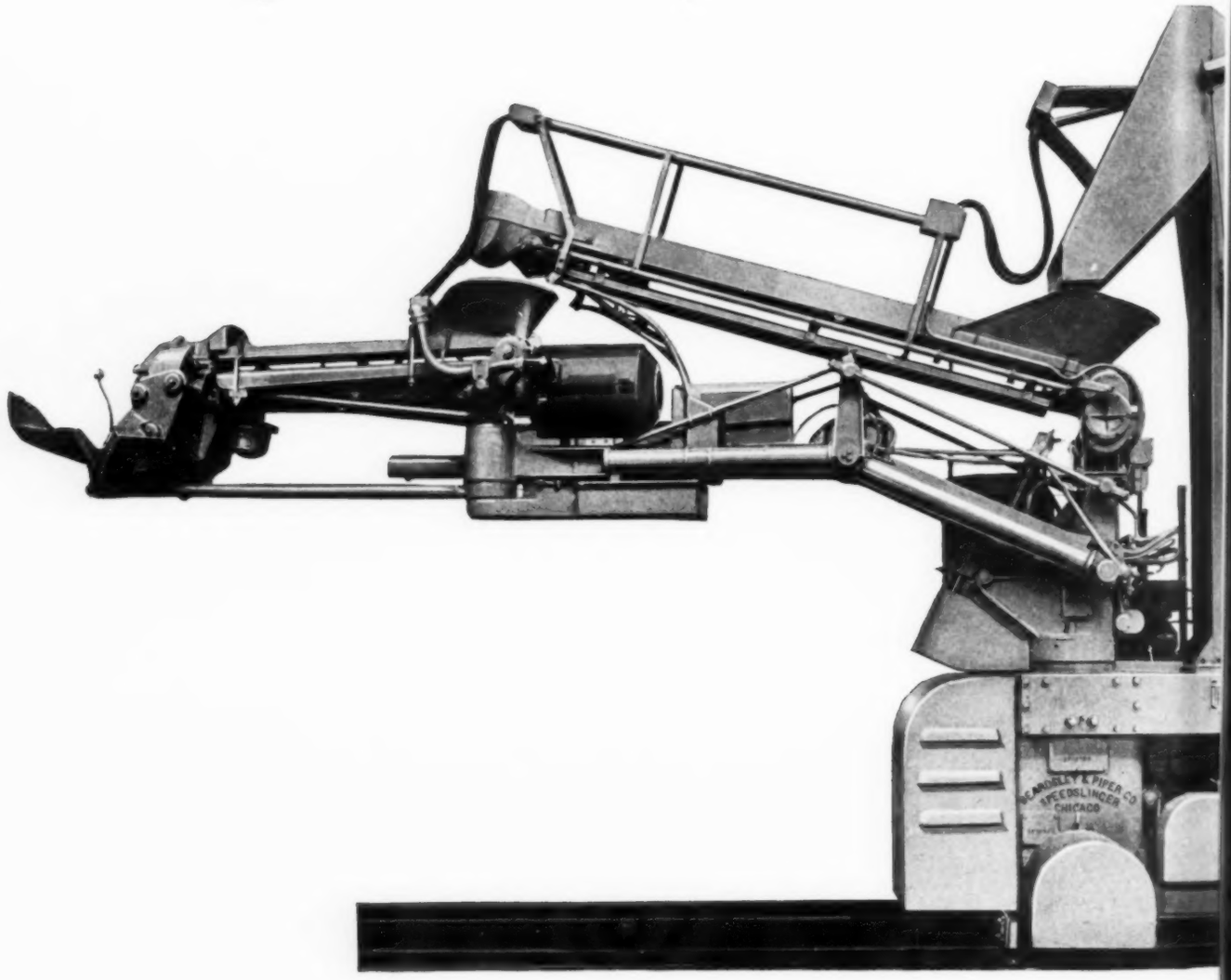
Wisconsin Arranges Regional Conference

The fifth annual regional foundry conference under the joint auspices of the Wisconsin Chapter of the A. F. A., and the University of Wisconsin will be held at the Schroeder Hotel, Milwaukee, Feb. 26 and 27. An innovation of the 1942 Wisconsin conference, which is expected to attract the largest attendance to date, will be the active participation of Wisconsin patternmakers on the program. A joint meeting will be devoted at this year's conference to pattern shop problems, while next year the patternmakers are expected to have complete sectional sessions for each day of the conference.

Howard C. Waldron, Nordberg Mfg. Co., Milwaukee, is chairman of the 1942 conference, and Prof. J.

(*Concluded on page* 110)

Speedslingers LEAD



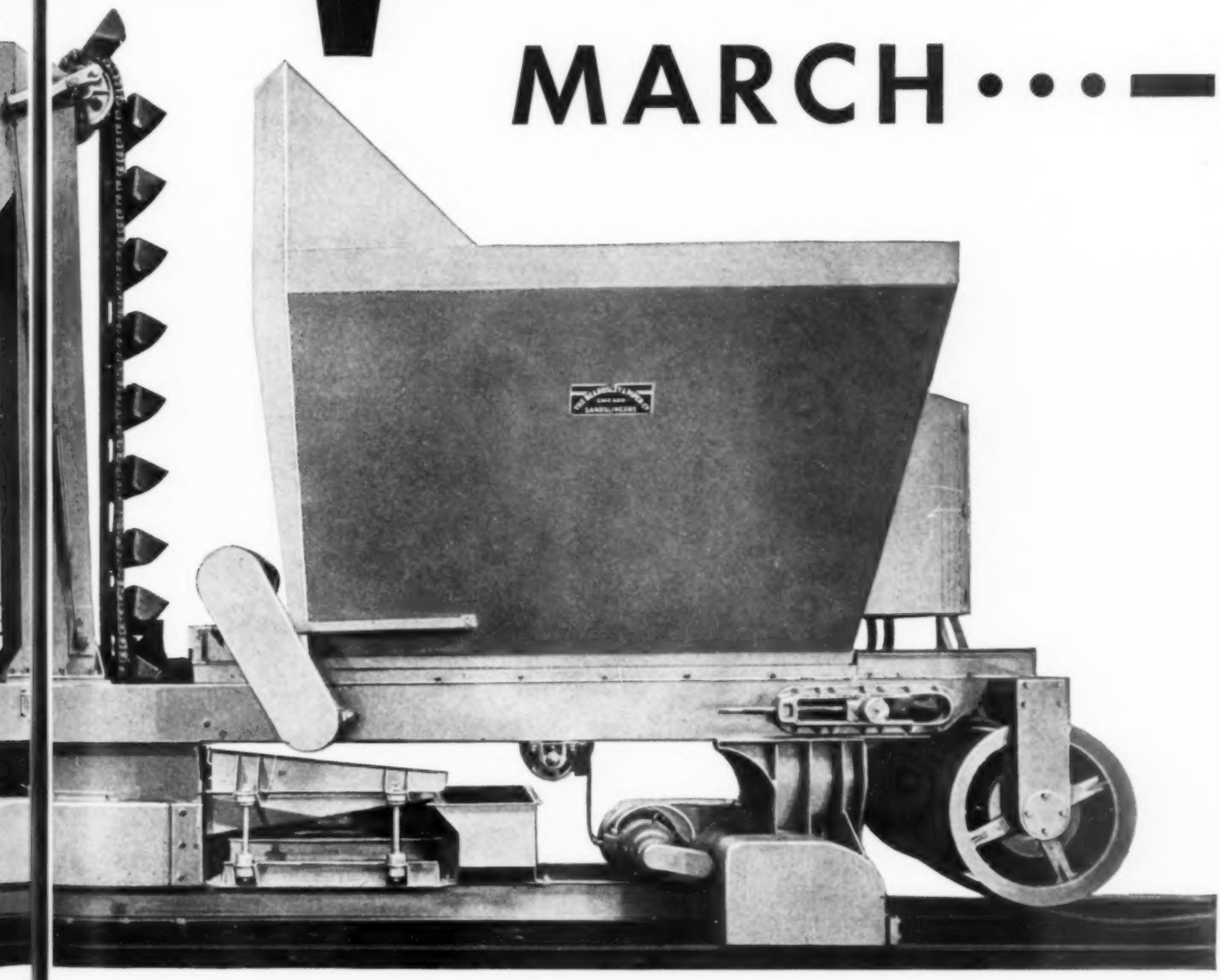
SPEEDS FOUNDRY PRODUCTION TO NEW HIGHS ••

Speedslingers are helping to "Remember Pearl Harbor" • • • — ramming up to 4,000 pounds of sand per minute, harder and more accurately than ever before achieved by man or machine • • • — rushing production of mammoth gun turrets • • • — enormous guns and gun mounts • • • — shells to pierce and shatter the stoutest enemy armour • • • — motor blocks for "jeeps" and tanks • • • — railroad car wheels to carry our fighting men and firing power • • • — ships' rudders and rudder posts to guide our ships • • • — ships' keels to carry our conquering forces • • • — parts for airplane motors that will wage the battle on the enemy front.

Speedslinger castings are helping to bring glorious Victory and lasting Peace to America.

THE BEARDSLEY & PIPER COMPANY 25

THE VICTORY MARCH • • • —



• • • — REDUCES RAMMING COSTS TO NEW LOWS

Speedslingers are proving daily on the toughest kind of Defense work that they ram two to four times more sand per minute and ram molds (from the smallest to the largest) harder and more accurately than ever before achieved by man or machine • • • — Ramming density is under the constant control of the operator who can ram to any density at any time, in any part of the mold • • • — A *Speedslinger* can save hundreds of dollars daily on average jobbing work • • • — make twice as many molds per day over former methods where the ramming operation is an important factor • • • — For Defense Production today • • • — for peacetime production tomorrow • • • — *Speedslingers* speed foundry production to new highs and reduce ramming costs to new lows.

2541 NORTH KEELER AVENUE, CHICAGO

(*Concluded from page* 107)

F. Oesterle, University of Wisconsin, Madison, Wis., is co-chairman. Other members of the regional conference committee are: A. C. Ziebell, Universal Foundry Co., Oshkosh, Wis., who is president of the Wisconsin Chapter; R. F. Jordan, Sterling Wheelbarrow Co., Milwaukee; G. K. Dreher, Ampco Metal Inc., Milwaukee; W. A. Hambley, Allis-Chalmers Mfg. Co., West Allis, Wis.; David C. Zuege, Sivyer Steel Casting Co., Milwaukee; F. A. Pritzlaff, Falk Corp., Milwaukee; John Bing, A. P. Green Fire Brick Co., Milwaukee; T. E. Ward, Badger Malleable & Mfg. Co., South Milwaukee, Wis.; Harry E. Ladwig, Allis-Chalmers Mfg. Co., West Allis, Wis.; Ben D. Claffey, General Malleable Corp., Waukesha, Wis.; Roy M. Jacobs, Standard Brass Works, Milwaukee; Walter Gerlinger, Walter Gerlinger Inc., Milwaukee; George M. Pendergast, George M. Pendergast & Co., Milwaukee; C. Haack, Wisconsin Gray Iron Foundry Co., Milwaukee; Lee E. Everett, Kaukauna Machine Corp., Kaukauna, Wis.; L. V. Tuttle, Koehring Co., Milwaukee; R. C. Woodward, Bucyrus Erie Co., South Milwaukee, Wis.; C. F. Haertel, Falk Corp., Milwaukee; Paul C. Power, Maynard Electric Steel Casting Co., Milwaukee; Prof. E. R. Shorey, University of Wisconsin, Madison, Wis.; D. I. Dobson, General Malleable Corp., Waukesha, Wis.; Stephen Pohl, Federal Malleable Co., West Allis, Wis.; Arthur K. Higgins, Allis-Chalmers Mfg. Co., West Allis, Wis.; J. C. Stern, Ampco Metal Inc., Milwaukee; A. M. Fischer, Charles M. Jurack Co., Milwaukee; and R. G. Metzger, Nordberg Mfg. Co., Milwaukee.

The conference will open with registration from 11 a. m. to noon on Feb. 26. This will be followed by a luncheon at the Crystal ball room of the Schroeder hotel, at which the welcoming address will be by Pof. F. E. Johnson, dean of the college of engineering, University of Wisconsin.

The joint meeting for the pattern-makers will follow the luncheon and will be addressed by Albert F. Pfeiffer, superintendent of pattern shops, Allis-Chalmers Mfg. Co., on "Pattern and Casting Relationships."

Following the afternoon sectional sessions there will be a dinner in the crystal ball room at which a nationally known speaker will deliver the principal address.

The program is as follows:

Thursday, Feb. 26

11:00 a.m.—Registration, Schroeder hotel
12:15 p.m.—Luncheon, crystal ball room
1:30 p.m.—Welcoming address, Prof. F. E. Johnson, dean, engineering college, University of Wisconsin
2:00 p.m.—Joint meeting, A. M. Fisher, chairman. *Pattern and Casting Relationships*, by A. F. Pfeiffer, superintendent of pattern shops, Allis-Chalmers Mfg. Co., Milwaukee
3:30 p.m.—Gray iron, A. Haack, chairman. *Melting Practices*, by John Lowe, Battelle Memorial Institute, Columbus, O.
Malleable, M. Harder, chairman. *Core Clinic*, by William Buckholtz, Belle City Malleable Iron Co., Racine, Wis.
Steel, W. F. McKee, chairman. *Steel Casting Design in Relationship to Quality and Cost*, by Lee E. Everett, Kaukauna Machine Corp. and George Anderson, Bucyrus Erie Co.
Nonferrous, A. Higgins, chairman, *Priorities and Allocations*, by W. K. Evans, priorities division, OPM, Chicago.
7:00 p.m.—Dinner, crystal ball room addressed by nationally known speaker.

Friday, Feb. 27

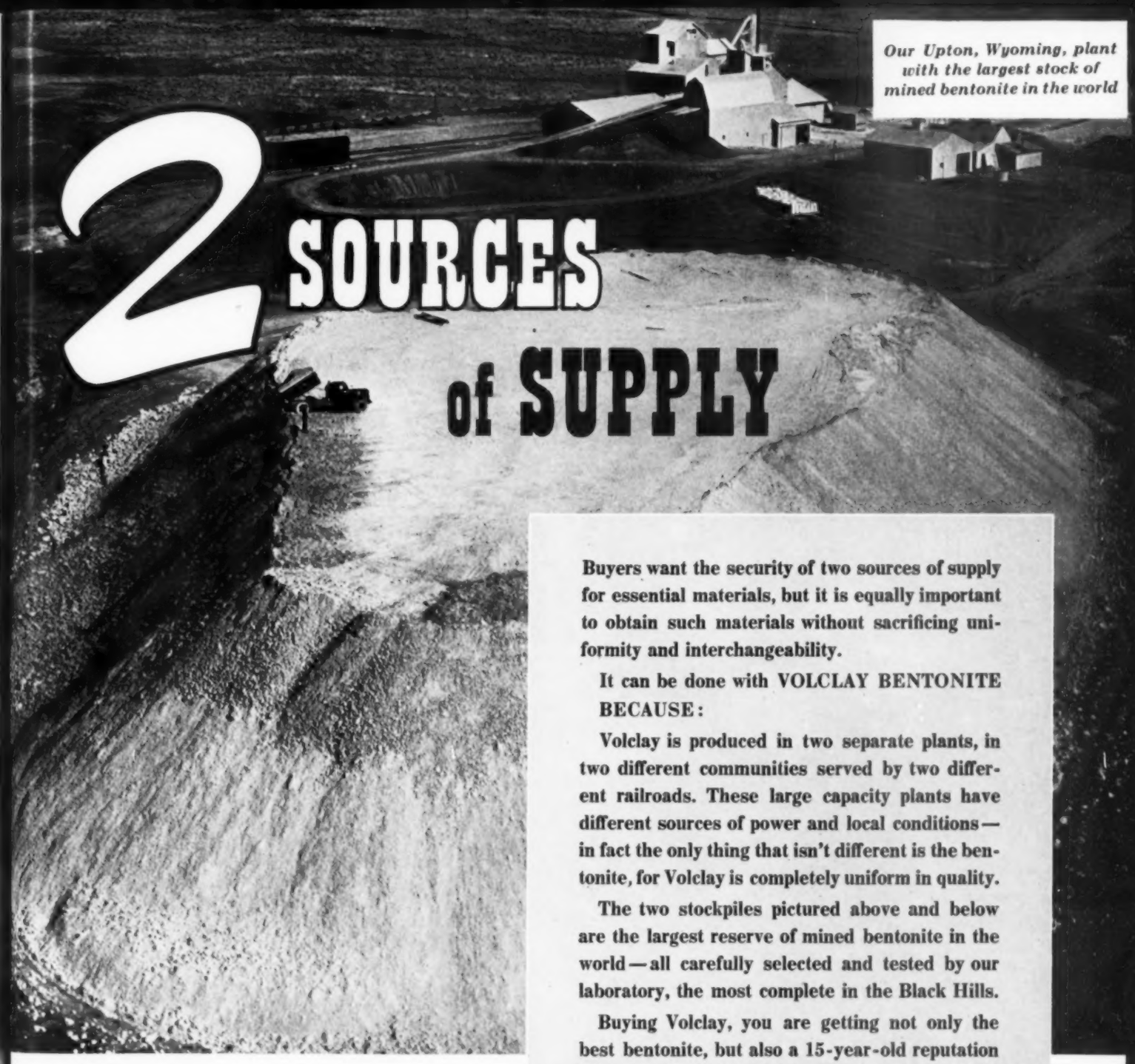
9:00 a.m.—Gray iron, Lee E. Everett, chairman. *Recent Developments in Cores and Molding Sands*, by N. J. Dunbeck, Eastern Clay Products Co., Eifort, O.
Malleable, E. Hanson, chairman. *Casting Design*, by James H. Lansing, Malleable Founders Society, Cleveland.
Steel, H. Hoffman, chairman. *Magnaflux Testing*, by R. Blum, Ladish Drop Forge Co., Milwaukee. *Gamma Rays and X-Ray*, by E. J. Wellauer, Falk Corp., Milwaukee.
Nonferrous, J. C. Stern, chairman. *Plaster Molding*, speaker to be announced later.
10:30 a.m.—Gray iron, A. Haack, chairman. *Casting Defects* by William A. Hambley, Allis-Chalmers Mfg. Co., Milwaukee.
Malleable, E. P. Mayer, chairman. *ArmaSteel—Defense Material*, by Carl Joseph, Saginaw Malleable division, General Motors Corp., Saginaw, Mich.
Steel, J. Wettergreen, chairman. *Behavior of Steel Facing Sands and Core and Mold Washes at Elevated Temperature*, by Harry W. Dietert, Harry W. Dietert Co., Detroit.
Nonferrous, J. C. Stern, chairman, *Centrifugal Castings* by W. Edens, Ampco Metal, Inc., Milwaukee, and H. Zuehlke, Allis-Chalmers Mfg. Co., Milwaukee.
12:15 p.m.—Luncheon and joint meeting, crystal ball room. Prof. J. F. Oesterle, chairman, speaker President Dykstra, University of Wisconsin.
1:45 p.m.—Gray iron, Lee E. Everett, chairman. *High Test and Alloy Castings*, by Herman C. Aufderhaar, Electro Metallurgical Co., Chicago.
Malleable, L. Harkrider, chairman. *Recent Developments in Annealing Malleable Iron*, by W. D. MacMillan, International Harvester Co., Chicago.
Steel, D. Zuege, chairman. Speaker, F. A. Melmoth, Detroit Steel Casting Co., Detroit.
Nonferrous, A. Higgins, chairman. *Gates and Risers*, by A. C. Busch, Charles C. Kawin Co., Chicago.
3:30 p.m.—Joint meeting, Crystal ball room, speaker to be announced later.

The two pictures shown include practically all members of the Wisconsin Chapter's conference committee. The regional foundry conference sponsored by that chapter will be held at the Schroeder Hotel, Milwaukee, Feb. 26 and 27. Photos courtesy of John Bing, A. P. Green Fire Brick Co., Milwaukee

Inaugurates 4-Year Educational Course

Chicago Chapter, American Foundrymen's Association, has inaugurated the first year's series of a four-year educational program designed to teach ambitious young men subjects that are prerequisite to the development of good supervisors. Apprentices, foundrymen, salesmen and others interested in

(*Concluded on page* 112)



Our Upton, Wyoming, plant with the largest stock of mined bentonite in the world

2 SOURCES of SUPPLY

Buyers want the security of two sources of supply for essential materials, but it is equally important to obtain such materials without sacrificing uniformity and interchangeability.

It can be done with VOLCLAY BENTONITE BECAUSE:

Volclay is produced in two separate plants, in two different communities served by two different railroads. These large capacity plants have different sources of power and local conditions—in fact the only thing that isn't different is the bentonite, for Volclay is completely uniform in quality.

The two stockpiles pictured above and below are the largest reserve of mined bentonite in the world—all carefully selected and tested by our laboratory, the most complete in the Black Hills.

Buying Volclay, you are getting not only the best bentonite, but also a 15-year-old reputation for dependability and quality.

VOLCLAY *Bentonite*

American Colloid Company

CHICAGO

Another large stock pile at our Belle Fourche, South Dakota plant

(*Concluded from page* 110)
broadening their knowledge of foundry problems and production of better castings also will benefit from the course.

First ten lectures and two castings clinics comprising the first year course started Jan. 13, and will continue at 7:15 p.m. Tuesday evenings through April 14. Meetings are held in the auditorium of the Peoples Gas building, 122 South Michigan avenue. M. E. Johnson, Whiting Corp., Harvey, Ill., is secretary of the course.

So that those who attend get the most out of each subject, only a a few selected subjects will be given each year and more lectures will be devoted to each subject. Experienced educators and practical foundrymen have been engaged to conduct the course. All lectures will be recorded and copies of important data supplied to enrollees for future reference.

The 1942 lectures constitute essentially an introduction to the extended 4-year program and will deal with castings in industry, raw materials for castings, blue print reading and elementary drawing, and patterns and pattern design. Outline of the 1942 educational course is as follows:

Castings in Industry

Lecture 1, Jan. 13—D. P. Forbes, Gunite Foundries Corp., Rockford, Ill.
Lecture 2, Jan. 20—Col. F. R. Zimmerman, Chicago Ordnance District, United States Army.

Raw Materials for Castings

Lecture 3, Jan. 27—Sound movie "From Mines to Machines," R. A. Lindgren, Wisconsin Steel Works, International Harvester Co., Chicago; and G. P. Phillips, International Harvester Co., Chicago.
Lecture 4, Feb. 10—"Metallurgical Fuels—Coal, Coke, Gas and Oil."
Lecture 5, Feb. 24—"Metals Used in the Foundry," Carl O. Thieme, H. Kramer & Co., Chicago.

Blue Print Reading and Elementary Drawing

Lecture 6, March 3—Prof. V. L. Sherman, former professor, Lewis Institute, and consultant, Chicago; and J. E. Kolb, Caterpillar Tractor Co., Peoria, Ill.
Lecture 7, March 10—Prof. V. L. Sherman.

Patterns and Pattern Design

Lecture 8, March 17—M. J. Gregory, Caterpillar Tractor Co., Peoria, Ill.
Lecture 9, March 24—E. J. Brady, Western Foundry Co., Chicago.
Lecture 10, March 31—H. K. Swanson, consulting patternmaker, East Chicago, Ind.

Castings Clinic

Lecture 11, April 7—To be announced later.
Lecture 12, April 14—W. H. Hambley, Allis-Chalmers Mfg. Co., Milwaukee; R. Frazier and A. S. Klopf, Hansell-Elcock Co., Chicago.

Eastern Stoker division, Link-Belt Co., has moved its sales office from Philadelphia to the Graybar building, 420 Lexington avenue, New York. K. C. Ellsworth is in charge.

Issues Summary on Apprenticeship

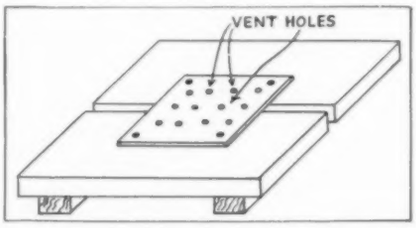
National Founders Association, 120 South La Salle street, Chicago, recently has issued the 1941 *Summary of Apprenticeship Practices in Foundries* which makes available information gathered from 150 foundries relative to apprentice practices and methods. This information is supplemented with other data and practices which have been used at arriving at a program for apprentice training. The National Founders Association has encouraged and cooperated in apprentice programs for over 30 years.

The publication is not a text book on foundry practice, materials, methods or equipment, but was compiled for the benefit of managers, superintendents and foundry instructors, the first two on the advisability, scope and extent of the program, and the third on the selection and arrangement of suitable material for instruction purposes. Three charts show: (1)—Co-operative district plan including public vocational school. (2)—Co-operative district plan with privately managed school. (3)—Individual plant plan for employe training. Two appendixes cover: (1)—Making dry sand cores, an example of text material (2)—List of references and texts for the foundry. General scope of the work is shown in the following list of subjects covered: Apprentice training and upgrading, scope and aim of training, length of apprenticeship, rates of pay, schedule of advancement, opportunities, branches of training, shop training, related instruction, (time, where given, instructors, subjects, questionable material, examples of text) lesson sheets, questions, method of furnishing text material, graduate apprentices, plan of publications.

Save Bottom Boards

By John Sonnenfield

A little improvement on wooden bottom boards which after several months application in the foundry was found to effect a saving of 50 per cent on lumber for bottom boards alone is shown in the accompanying rough sketch. Wood bottom boards, especially when heavy section castings are poured, will last but a short time since they burn through under the heaviest metal section—usually in the center of the board. However, instead of throwing away the burned board it is made usable again by nailing a piece of sheet steel over it. Vent holes in the steel sheet are advisable. We now are having all new bottom boards made with the sheet steel nailed on, and the saving obtained on lumber for side floor or snap flask bottom boards is quite gratifying.



A piece of perforated sheet steel nailed over the burned portion of the bottom board makes it serviceable again

---

Electrons Explain Iron Behavior

Free electrons which float around between the atoms of solid iron and its alloys are responsible for many of the properties of these alloys, according to Dr. Roman Smoluchowski, General Electric Research Laboratory physicist, in a paper presented at a meeting of the American Physical Society held in December at Princeton, N. J.

He presented a new conception of the role which these "free" electrons play. Applied in practice, it may lead metallurgists to a better understanding of what happens when other elements are added to iron, making the alloys so important to industry, in peace as in war. Atoms of iron, like others, consist largely of electrons, each carrying a negative electrical charge, encircling a positively charged nucleus. These atoms are arranged in a lattice formation, making up the metallic crystals.

But also in iron, as in all metals which are electrical conductors, there are other electrons floating around in this lattice, not connected to any particular atoms. The drift of these so-called "free" electrons is responsible for the conduction of electricity as well as of heat.

Pure iron at ordinary temperatures has a crystal structure in which the atoms are arranged in the form of interlocking cubes, the corners of each cube forming the centers of adjacent cubes. Thus, they form what is called the "alpha phase" arrangement, and this makes for toughness and strength.

However, when iron is heated there is a change at the temperature of 900 degrees Cent. (1650 degrees Fahr.). It then goes from the normal alpha phase to the gamma phase. Here the atoms are more closely packed than in the alpha phase and the whole metal contracts slightly. If the heating is continued,

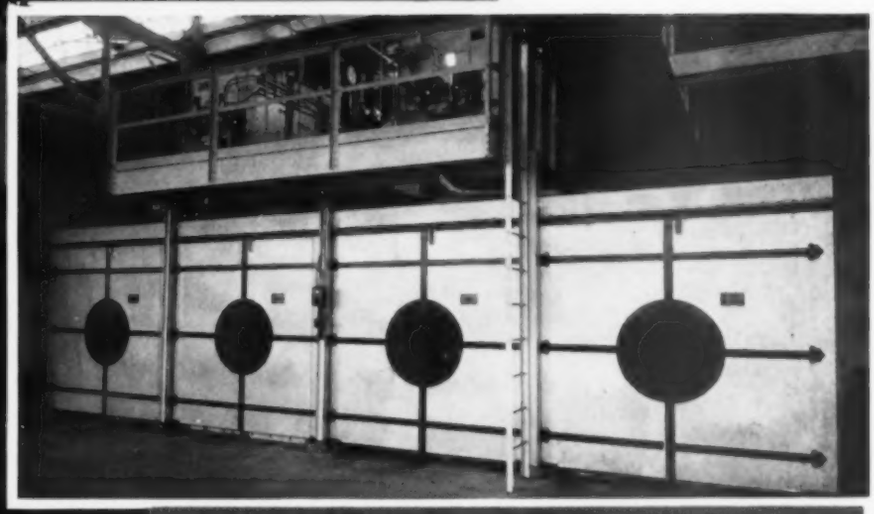
(*Concluded on page* 114)

For faster production of fighting equipment..

AIRPLANES

SHELLS

CARL-MAYER Core and Mold Ovens



Oval-shape coal fired furnace in use at American Magnesium Division of Aluminum Co. of America . . . (Recently completed fourteen at Cleveland and ten at Fairfield, Conn. for same company)

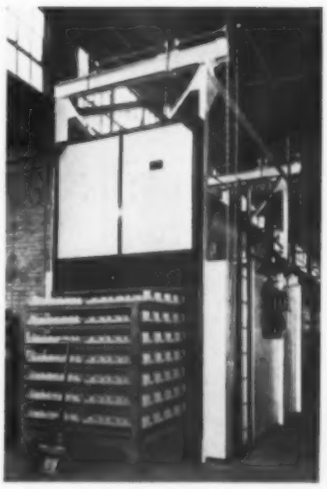
SERVING PROMINENT CONCERNS LIKE THESE

Average more than three (3) repeat orders per customer!

ALUMINUM CO. OF AMERICA
AMERICAN MAGNESIUM CORP.
AMERICAN RADIATOR CO.
BABCOCK & WILCOX CO.
BUCYRUS-ERIE CO.
BROWN INDUSTRIES CORP.
DUNKIRK RADIATOR CO.
ECLIPSE AVIATION DIVISION OF BENDIX AVIATION CORP.
ELECTRIC AUTOLITE CO.
FORD MOTOR CO.
FOX FURNACE CO.
FORT PITT STEEL CASTING CO.
FRANK FOUNDRIES CORP.
FREMONT FOUNDRY CO.
G & C FOUNDRY CO.
GENERAL MOTORS CORP.
GENERAL ELECTRIC CO.
GILBERT & BARKER CO.
INTERNATIONAL HEATER CO.
OHIO INJECTOR CO.
PACKARD MOTOR CO.
SHENANGO PENN MOLD CO.
STUDEBAKER CORP.
WHITEN MACHINE WORKS
WHITING CORP.

Carl-Mayer's 20 years of specialization in industrial oven and furnace equipment have been replete with outstanding achievements in design, efficiency and fuel economy. TODAY, Carl-Mayer's Core and Mold Ovens are in the "thick of the battle" for faster, smoother production of castings urgently needed in the construction of war equipment.

Write or wire for illustrated Bulletin 141 or a Carl-Mayer Oven Engineer.



One of Two Rack Type Core Ovens at Fremont Foundry Co., saving two to three hours per bake.

The Carl-Mayer Corp., 3030 Euclid Ave., Cleveland, Ohio

CARL-MAYER CORE AND MOLD OVENS
ARE BUILT IN ALL TYPES AND SIZES, AND FOR ANY FUEL

(*Concluded from page* 112)
at 1400 degrees Cent. (2550 degrees Fahr.) the metal changes back to the alpha phase, which is retained until it melts, at 1535 degrees Cent. (2800 degrees Fahr.).

When other metals are alloyed with iron, they form a solid solution, comparable to liquid solutions, salt in water for example. Some alloying metals increase the range of temperatures over which the gamma phase occurs, while others decrease it or eliminate it entirely. Knowledge of their effects is very important to the metallurgist in planning an alloy for a particular use. If a part in a machine has to withstand a temperature of perhaps 1000 degrees Cent., it would not do for the alloy of which it is made to change phase while in operation. One then has to add a metal which prevents formation of the gamma phase. On the other hand, a metal which would have this valuable property might introduce other undesirable properties, as for instance lessened resistance to corrosion. Hence it is necessary to have a selection of alloying agents, from which the proper choice may be made.

All the 92 elements can be arranged by their atomic weights in a checkerboard fashion, to form the well-known "periodic table." Iron comes close to the middle. It has been found by previous experimenters, said Dr. Smoluchowski, that all the elements to the right of iron (and which can dissolve in it) increase the range of temperature at which the gamma phase occurs. All to the left, with a few exceptions which can be explained, decrease the gamma range, or eliminate it entirely.

According to Dr. Smoluchowski, this remarkable regularity is explained by changes in the energy of the free electrons in the crystal lattice of an iron alloy with the addition of other atoms. "The elements to the right of iron, such as nickel, cobalt and platinum, have more free electrons per atom than iron," he stated. "Thus they contribute electrons to the iron lattice. In contrast, those on the left, including vanadium, chromium, tungsten and molybdenum, take them away.

"Both the number of available electrons and the forces which attract them to atoms are in many cases known from other investigations. On this basis, it is possible to explain even some finer details of the observed phenomena. The more electrons there are per atom, the more stable is the gamma phase," he said, and showed how this follows from the modern quantum-mechanical theory of metals. He stressed also the value of this consideration for practical problems, where it introduces a correlation between a large amount of observed, but apparently unrelated, facts.

Conserve Manganese

A committee of the American Iron and Steel Institute, with C. H. Herty Jr. Bethlehem Steel Co., Bethlehem, Pa. as chairman, recently reported on a study of the possibilities of conserving manganese in steel production.

The report contains the following paragraph dealing with steel castings:

As a result of contacts with various steel castings producers, it is the opinion of the committee that steel castings can generally be made with a 0.70 per cent maximum manganese content, except for certain special products. It is recommended that the producers of steel ingots produce their castings with the maximum content of manganese. The committee suggests that this conclusion be called to the attention of the American Foundrymen's Association with the request that it consider some similar recommendation for the steel castings industry.

Selecting Sirens

Federal Electric Co., 8700 South State street, Chicago, recently has published a folder, "How To Select, Install and Use Sirens for Air Raid Protection," by W. W. Scott, manager, signal division of that organization. The text deals with experience in the use of sirens for air raid protection, location of the sirens, installation, and operation.

H. Kramer & Co., 1359 West Twenty-first street, Chicago, has started construction of a $350,000 addition to its plant. The additions include several buildings.

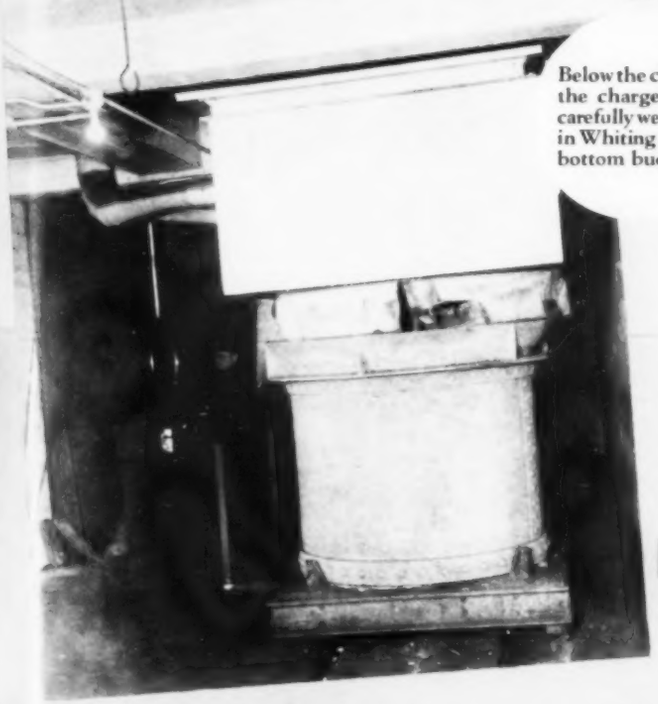
Reports received at The Foundry office indicate that many companies presented Defense Savings Bonds and Defense Savings Stamps to employes as a part of the Christmas celebration. That such gifts were received with enthusiasm is shown in the illustration below of employes of the Hamilton Foundry & Machine Co., Hamilton, O. Left—John Reuman, molder at Hamilton Foundry & Machine Co. with his Defense Bond and Christmas basket of food. Center—Reading left to right, Don McDaniel (with glasses), vice president of the firm; Peter E. Rentschler, president; Brown Young, molder; Whilsey Dudley, apprentice floor molder, and Robert Leonard, chief of plant protection guards. Right—Norma Rasner, clerk, with her Defense Stamp album

A SECOND
Whiting Charging System
INSTALLED AT
ALLIS-CHALMERS

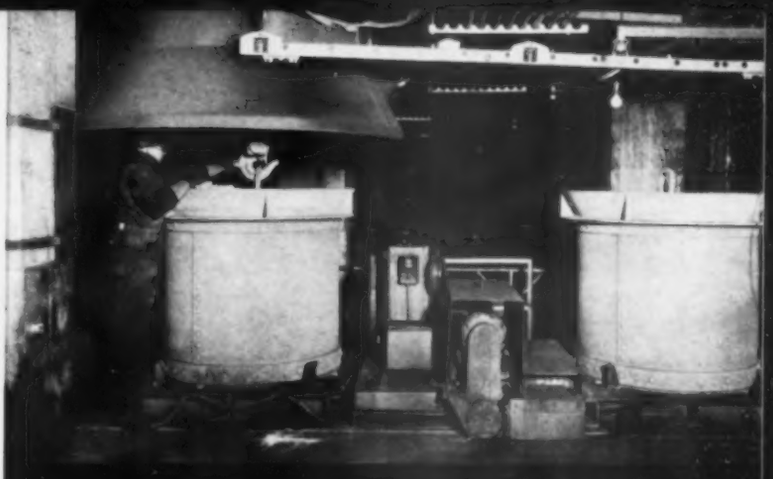
One good installation deserves another. At Allis-Chalmers' No. 1 Foundry in Milwaukee, the specially-designed Whiting charging system proved so satisfactory that a second Whiting charger was ordered immediately for the No. 2 Foundry. This new system is shown in the following illustrations.

1 Traveling crane in material yard places iron and scrap into make-up loading chute.

2

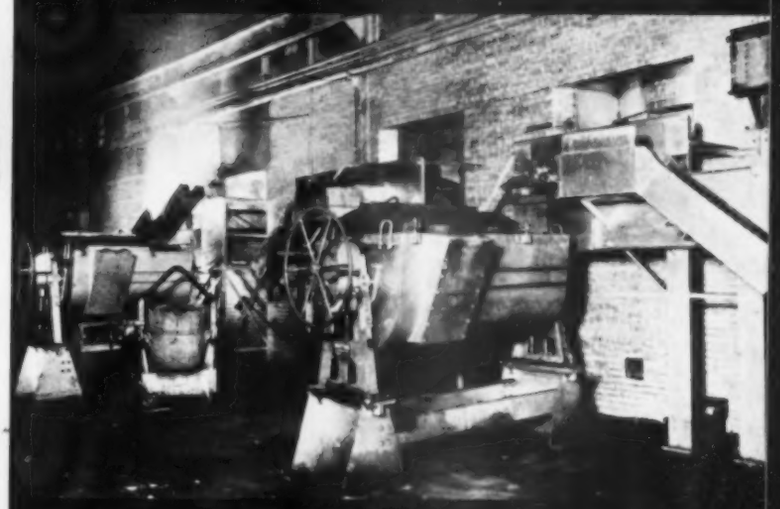


Below the chute, the charges are carefully weighed in Whiting cone-bottom buckets.



3 Whiting motor-driven transfer cars are used to move loaded buckets from under the loading chute to the pick-up point.

4 An underslung crane-type Whiting charger picks up the cone-bottom bucket and discharges it into one of two Whiting cupolas.



5 On the tapping side of the cupolas, thorough mixing and continuous desulphurizing is provided by two Whiting U-ladles.

WHITING
MECHANICAL CHARGING SYSTEMS

LADLES • FURNACES • CUPOLAS

SIMPLIFY YOUR CHARGING PROBLEMS

with a Practical Charging System

Whatever your charging problems may be—low melting ratios, difficult supervision, bad working conditions, or high casting costs—they can be materially simplified, and frequently completely solved, by use of a properly engineered mechanical charging system.

Mechanical charging gives careful control of the weight, handling, and distribution of the charge, permits the charging door to be raised, and provides a higher coke ratio and greatly improved melting practice. Supervision is made easier by the regular and efficient operation of the mechanical system. Working conditions are improved through elimination of the charging floor and removal of the charging crew from the heat and gases of the charging door. In most instances, sufficient savings will be realized to retire the investment in less than two years.

Send for New Mechanical Charging Book Today

Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.

WHITING Individually Engineered MECHANICAL CHARGERS

1. Fit Local Plant Conditions
2. Lower Casting Costs
3. Improve Melting Practice
4. Simplify Supervision
5. Eliminate Charging Floors
6. Provide Better Working Conditions
7. Improve Safety

WHITING MECHANICAL CHARGING SYSTEMS

READER'S COMMENT

Readers are invited to comment upon articles and other editorial material appearing in THE FOUNDRY. *The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief.*

THE EDITORS

Cupola Melting

TO THE EDITORS:

Reading your January number, I find on page 63 Mr. Reese sets an upward limit of 9½ pounds of coke per square foot of cupola area, running down to as low as 7 pounds. Over on page 63 your "Questions and Answers" column says that 25 pounds of coke is too small a charge for a 20-inch cupola. This figure gives 11½ pounds per square foot.

You ought to get your experts together. As a matter of fact, I am much more inclined to agree with Reese. We operate a 21-inch cupola with a 15-pound coke charge and 125 pounds of iron, and have run it very successfully at the rate of approximately a ton and a half an hour with the iron at 2850 degrees and blast pressure of 7 to 9 inches of water. We have operated the cupola with as little as 6 pounds of coke charge and 50 pounds of iron for the purpose of getting a better mixture in the 100-pound ladle. I can see no difference other than that of superior mixture in running these small charges. As a matter of fact, the size of the charge has nothing to do with the combustion of the cupola, provided the coke charges are not so thick that melting stops or slows down appreciably on account of the periodic raising of the bed when each charge of coke reaches the melting zone. However, we find that in mechanical charging a charge of 12 inches gives better results than a charge of 6 inches largely due to the difficulty of getting uniform distribution of the thinner charges. Provided the bed is set at a suitable height at the beginning of the heat, the amount of blast within wide limits does not affect anything but speed of melting.

DR. JAMES T. MACKENZIE
Chief Metallurgist
American Cast Iron Pipe Co.
Birmingham, Ala.

Foundry Celebrates 35th Anniversary

On Dec. 20 nearly 250 employes of the West Steel Casting Co., Cleveland, gathered at the foundry to celebrate a joint annual Christmas party and to observe the firm's thirty-fifth anniversary. Following a buffet luncheon the group was addressed by Lieut. Gathercoal, official representative of the United States Navy, who called attention to the necessity of still greater production of war materiel, and commended the employes and the firm for their efforts in meeting requirements in the past.

David Dietz, science editor, Scripps-Howard Newspapers, spoke briefly on "Industrial Activity in Cleveland Today", stating that since the treacherous attack on Pearl Harbor by the Japanese, employes and firms in this district joined together in a united front and were bending all their energies to further this country's war effort.

Ralph H. West, president, West Steel Casting Co., pointed out the importance of the steel foundry industry in democracy's battle against dictatorship, and stated that while a terrific load had been placed on the industry, it had responded to the challenge. For example, his own firm had more than doubled production, and expected further increase in 1942. Mentioning the establishment of the firm thirty-five years ago, Mr. West stated it was only through the loyalty and cooperation of its employes that it had reached its present position. He said in view of recent world events, he knew that he could rely on the employes to exert still further their efforts to meet war demands, and pledged the management to do likewise.

Mr. West announced that every employe with one year or more service with the firm would be given a $25 defense bond, and those with less service would be given defense saving stamps in proportion to the length of time. Charles Martin and Andy Remic presented to Mr. West on behalf of the employes a beautifully engraved plaque commemorating the thirty-fifth anniversary of the firm while Samuel B. West presented him with a handsome wrist watch on behalf of the firm.

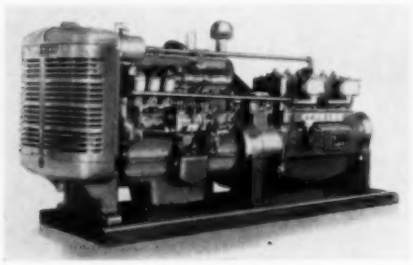
Browntown Silica Co., Browntown, Wis., suffered a $150,000 fire which destroyed its main plant. The fire followed an explosion which bore the suspicion of sabotage. The company has been filling defense contracts and production will be halted for several months.

Nearly 250 employes of the West Steel Casting Co., Cleveland, celebrated a joint Christmas party and thirty-fifth birthday of the firm. The view shows management, office workers, and guests. Ralph H. West, president of the firm, is shown in the center holding the engraved plaque

NEW EQUIPMENT and Supplies

Air Compressor

Schramm Corp., West Chester, Pa., recently has added a new engine drive-in line compressor to its extensive line. The new model



shown in the accompanying illustration is built in sizes ranging from 120 to 600 cubic feet displacement and is available for applfcations not reached by electric power service or where gasoline, oil, distillate or diesel power units are preferred as driving mediums. A number of standard assemblies are provided in semi-portable and stationary types. Mounted on a sturdy deck type base ready for immediate operation it is claimed these light, compact, easy to handle combinations are used with equal success for semi-permanent service where the demand for air does not warrant a large compressor. In isolated or arid locations where running water is not available, the advantages of water cooling may be retained by using radiator water cooling.

Blackout Paint

Tamms Silica Co., Chicago, recently has developed two grades of cold water paints for blackout purposes. One is for interior application and the other for exterior. Paints are supplied in powder form and it is claimed that they can be mixed easily with the addition of water only for application either by brushing or spraying. Finish is said to be an intense black, very flat and devoid of gloss or glare so that it will not reflect artificial light or that from the sun or moon. Five pounds of the powder mixed with water will cover about 350 square feet. When no longer needed the paint can be removed by washing. For complete blackout it is recommended that windows be painted inside and outside.

Heavy Duty Hoists

Chisholm-Moore Hoist Corp., Tonawanda, N. Y., recently has developed a new line of heavy duty electric hoists ranging in size from ½-ton up. The hoists are said to have a streamlined design which provides compactness and eliminates excess weight. Airplane type

cooling fins are used for rapid dissipation of heat generated by gears and load brake. The hoists are enclosed fully and can be used indoors or outdoors. Safety type hook blocks are fully enclosed, and the electrical system is claimed to be designed so that only 110 volts passes through the push-button station.

Dust Collector

The David-Newcomb Co., 5741 Russell street, Detroit is introducing a new water type dust collector designed to remove dirt, dust etc., efficiently from the air. Cartridge type ball bearings are ring sealed with lubricating fittings. It is only necessary to add water to the original supply when the sludge tank is drained periodically. Air enters through a pipe in the back or at either side. An exhaust fan draws the air in combination with a water spray through a circular suction cone. The cleaned air passes through the exhaust fan either to the outside atmosphere or to the working area. The dirt removed from the air falls into the sludge tank from which it is removed through a compartment on the front of the unit, even when the dust collector is in operation. The complete unit is shipped ready to be set up by the customer's employes, or by a local sheet metal firm.

Gyratory Riddle

Jefferson Machine Tool Co., Cincinnati, has developed a gyratory riddle, shown in the accompanying illustration and constructed of drawn steel channels fastened to a cast iron receptacle for motor, gyrator housing and a two-piece sheet steel riddle frame. Total height 60 inches. One size takes a 20-inch diameter riddle. A second size takes a 24-inch diameter riddle. Motor is

1/6-horsepower, fully enclosed, ball bearing, 110 or 220 volts, 900 revolutions per minute, either direct or

(*Continued on page* 120)

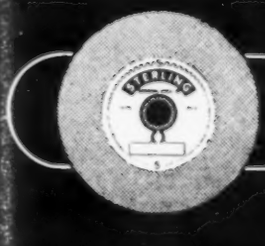
NOW, they are available--two Sterling Grinding Wheels for almost every type of weld. No longer is it necessary to have many types of grinding wheels for your welds . . . these two Sterling Wheels will do the job!

For steel, Sterling specification RK 14 L P4 PC supplied in straight or flaring cup wheels are used for grinding welds. For cast iron, Sterling specification RC 14 L P5 PC is employed.

There need be no guesswork when using these wheels. They have been designed to hurry up war production, and will do it in your department. Ordnance plants, in particular, will welcome the new efficiency supplied by these Sterling Grinding Wheels.

Requisition these Sterling specifications and increase the efficiency of your war effort . . .

Sterling engineers will gladly tell you more about these "Wheels of Industry".



• STERLING ABRASIVES •

THE
STERLING GRINDING WHEEL DIVISION
OF THE CLEVELAND QUARRIES COMPANY
TIFFIN, OHIO

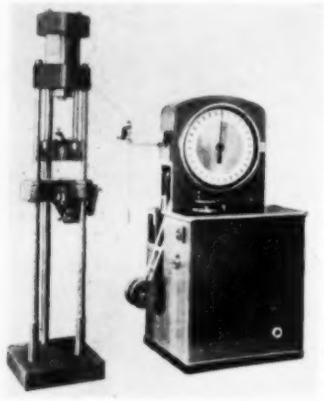
THE WHEELS OF INDUSTRY

(*Continued from page* 118)

alternating current. Can be plugged into light or power circuit. The motor is mounted on the cast receptacle and coupled to the gyrator with a flexible coupling to eliminate vibration. One section of the riddle frame is hinged to facilitate change or removal of the riddle.

Testing Machine

Riehle Testing Machine division, American Machine & Metals, Inc., East Moline, Ill., recently placed on the market a new model precision hydraulic universal testing machine in capacities from 10,000 to 300,000 pounds with a maximum separation of gripping heads of 40 to 52 inches and with the upper head in convenient reaching position. Accuracy, ruggedness simplicity and reliability it is claimed are insured by the



pendulum load indicator since only two elementary quantities of weight and distance are to be measured in linear units. One revolution of the hand wheel covers the complete range of hydraulic control: Adjusting speed, loading speed, zero, unload and fast return. The machine illustrated can be equipped with extra features, automatic recorder, pacing ring for constant rate of load and mechanism to hold loads constant for any period.

Blasting Nozzle

An extremely hard, abrasion resisting ceramic now is being used instead of metal inserts in the abrasive blast nozzle manufactured by the American Foundry Equipment Co., 505 South Byrkit street, Mishawaka, Ind. It is said that the product is the result of years of research of colloidal chemistry. The ceramic insert is claimed to have a hardness and density greater than many of the metals now being used for that purpose.

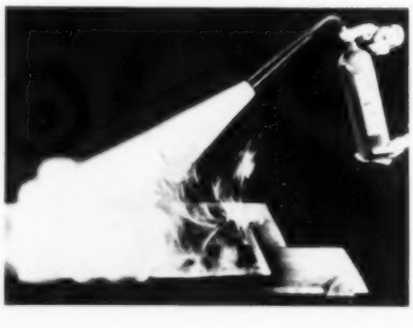
Additional features of the nozzle include the following: High finish bore, no soft spots to start uneven

wear; nonmetallic, thus reducing static; does not bell out rapidly; excellent mechanical strength; adaptability to any equipment. Two types of nozzles are available, namely the flange type and the screw type. Adapters can be supplied for fitting the nozzle in any type of air blasting equipment.

In addition to lower initial cost, savings are claimed for operation with this nozzle, including minimum cost of compressed air. Since the original orifice has little wear even after considerable service, the contour of the blast stream is said to be maintained, thus cleaning the work faster and with more uniformity.

Extinguisher

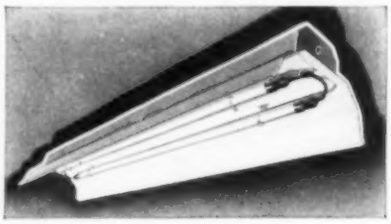
Walter Kidde & Co., Inc., Bloomfield, N. J., has made available as standard equipment on its new 4-pound carbon dioxide extinguisher, the trigger control valve recently developed for a 2-pound unit. This type of discharge it is claimed not only permits the extinguisher to go into action more rapidly, but insures no waste of carbon dioxide gas while the operator is manuevering around the blaze. When trigger pressure is released the discharge is shut off. With the nozzle arm equipped with a swivel the discharge horn is held in a down position when the extinguisher is not in use. In operation the horn is swung into the discharge position, aimed at the fire and the trigger is pulled. Specifications include: Carbon di-



oxide capacity 4 pounds; Underwriter's Laboratories rating B-2 and C-2; average charged weight 17 pounds; average height valve and cylinder 17½ inches; hose diameter ⅛-inch pipe; hose length 6 inches; cylinder diameter 4½ inches.

Fluorescent Light

Benjamin Electric Mfg. Co., Des Plaines, Ill., has designed new lighting equipment which is said to provide more light for power consumed, a new solution to the flicker problem, quicker and surer starting, lower installation and maintenance cost. It is also claimed that because of the higher lighting efficiency it is now practical to employ fluorescent lighting where high mountings or wide spacings of fixtures are required. With the new twin lamp 35 to 40 footcandles of general illumi-



nation can be provided with a power consumption of 200 watts when installed on normal 10 x 10 foot spacings, and with existing wiring. Full wave rectifier type circuit minimizes flicker and stroboscopic effect at the source. Separate starters are unnecessary. Units are available in single or twin lamps, open end model, special life time porcelain enamel. The units require 85 watt lamps, are 65½ inches in length and embody many advanced constructional features to facilitate installation and maintenance.

Drum Carrier

Ernst Magic Carrier Sales Co., Buffalo, announces the addition of a new little giant model to an extensive line designed and constructed for handling drums principally used as containers of heavy materials. It is stated that the new model has all the advantageous and exclusive features of the larger models. It is claimed that with the new model a man using one hand takes the place of several men required to break over, balance and move drums. Also accidents are prevented by a simple lifting device and self balancing tri-wheel design. Copper silicon alloy metal wheels and locking device are available where precaution against explosion is necessary. The new model has capacity up to 600 pounds.

YOU'RE ALWAYS SAFE IN SAVING!

THE desire to save is one "style" that doesn't change. Today, tomorrow, or next month, you're always in step when you institute a cost-saving process in your foundry.

If you use much core wire in your foundry, it would pay you to investigate the savings through straightening and re-using that wire.

The first step in your investigation might well be a request for our bulletin on the Climax Wire Straightener. You'll be surprised at the potential savings it tells about.

Present owners are amazed at the savings they make with their Climax.

Why not see what it can do for you?

THE WONDER CUTTER

When you save time, you save money, and you *can* save time with a Wonder Cutter.

Cutting rods with a hammer and chisel is like digging a well with a teaspoon — especially when you see how the Wonder Cutter nips them off.

The Wonder Cutter is a compact machine that takes very little bench space. Cutter dies are a hardened alloy that last indefinitely. Cuts soft rod up to 5/8" diameter as well as flats up to 1/8 x 2".

The lowest priced wire and band cutter!

THE LOWE RIDDLE

Sifts as fast as two men can shovel. Saves on power, saves on labor, and by furnishing a thoroughly aerated sand that handles easily, saves on scrap.

The Lowe Electric Riddle is the only sifter with the patented gyro-vibratory action. All the action is on the riddle which accounts for the Lowe's speed.

Low in first cost, inexpensive as to power and requiring the very minimum of repairs, you save all ways with a Lowe.

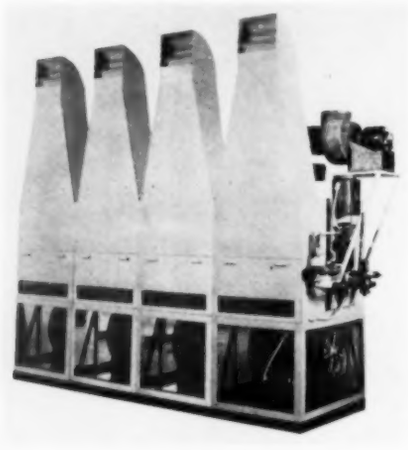
THE FEDERAL FOUNDRY SUPPLY CO.

4600 EAST 71st STREET, CLEVELAND, OHIO

CHICAGO—CHARLEROI, PA.—CHATTANOOGA, TENN.—DETROIT—MILWAUKEE—MINNEAPOLIS—NEW YORK—RICHMOND, VA.—ST. LOUIS—UPTON, WYO.

Unit Heater

Surface Combustion Corp., Toledo, O., is marketing a new heavy duty heater for heating large buildings. The unit is built up from a series of sections, each section having an in-



put rating of 250,000 B.t.u.'s per hour. Each section is complete with individual heat exchanger assembly, pilot, limit control and blower. Blowers of all sections are mounted on a common shaft driven by one motor. Sections are attached securely to a heavy channel iron base to insure ruggedness and alignment of the fan shaft.

Blackout Coating

Carbozite Corp., First National Bank Building, Pittsburgh, has developed a new blackout coating for industrial plant windows and skylights which is claimed to meet recommended practices. Feature of the coating is that it may be removed easily when danger no longer exists. The coating is not a paint but a smooth flowing liquid manufactured from a pyrobitumen ore, especially refined and mixed with quick drying, volatile solvents and a special ingredient which provides opacity and an absolutely gloss-free surface. The material can be sprayed or brushed on quickly, and only one coat is needed to give protection against light penetration. Drying is completed in 6 to 8 hours leaving a dead black surface.

Arc Welder

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has developed a new portable welder enclosed in a blue and gray one piece weather proof steel frame mounted on 4-wheel running gear. Ratings are 200, 300 or 400 amperes for 220, 440 and 550 volt alternating current circuits; 2 and 3 phase, 25, 50 and 60 cycles. Current adjustment is secured through a ball crank. Steady current regardless of arc length is provided by arc control adjusted to suit the job. No field rheostat exciter or external reactor is required. Driving motors are of the squirrel cage induction type with low starting current, high efficiency and high power factor. Push button controlled starter provides low voltage protection by removing motor from line if the line voltage is too low. Dual voltage coil on starter makes it possible to change operations from 220 to 440 volts without changing contactor coil. Automatic burnout protection is provided by a bimetal relay mounted on the motor stator windings.

Finger Guard

Industrial Gloves Co., Danville, Ill., recently designed a practical finger guard or finger stall combining tough leather and flexible lastex which it is claimed is comfortable, clean, easy off, easy on, light weight and durable. Protects fingers and thumb for buffers, polishers, sanders, grinders, stamping press operators,

small parts assemblers, trimmers, mechanics, and men and women machine operators. May be worn under glove for extra protection. Worn with leather on back of finger the guard protects knuckles. The guard is available in grain leather and lastex combination; heavy split leather; light weight kid leather or wool felt. All guards fit snugly, are flexible and porous for veltilation.

Aluminum Solder

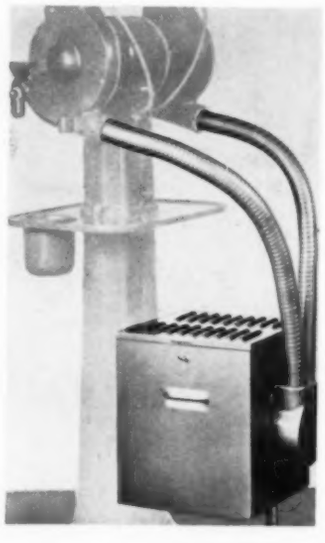
Metalloy Co., Los Angeles, is distributing a new soldering alloy for aluminum and aluminum alloys. The surface to be coated or soldered is heated with a welding torch to a temperature of 600 degrees Fahr. An alloy stick is applied directly to allow a small amount of the alloy to flow on to the surface. A stiff wire brush is used briskly until a bright finish is secured. In a heavy build up, more material is applied. Blow holes, spongy spots or other defects can be repaired readily. It is claimed the alloy will bond with any type of metal, also it may be used as a protective coating on welded seams or other areas where a noncorrosive coating is desired.

Steel Reamer

Black Drill Co., Cleveland, has designed a new type hard steel reamer capable of reaming steel of any hardness degree without annealing. It is claimed this type reamer has been used on carburized, oil hardened, water hardened, cyanided and nitrided, high carbon, high chrome and high speed steels, manganese steel and cored holes in chilled castings.

Dust Collector

Aget-Detroit Manufacturing Co., Detroit, has developed a compact, low cost, self contained unit dust collector as shown in the accompanying illustration. The unit is available in several sizes to meet existing conditioins. The device usually is connected to a single machine with flexible metal tubing. Ordinary pipe can be used where it is connected to more than one station. Dust pan has approximately 250 cubic inches dust capacity. Removal and replacement of cover, filter assembly and pan requires only a moment and no tools. One model designed for laboratory use has the large head connected to the unit and can be moved around as needed. A baffle plate prevents heavy material from the wheel from entering. Most of the heavy material drops into a removeable tray directly under the polishing or grinding wheel. Hinged adjustable splash guard prevents carry over of material to the operator.



Now More Than Ever You Need the

High Production of NORTON WHEELS

MORE important today than ever is Norton's ability to supply the correct wheels for every grinding job in the foundry—wheels that cut faster and last longer because they are exactly fitted to the job they must do.

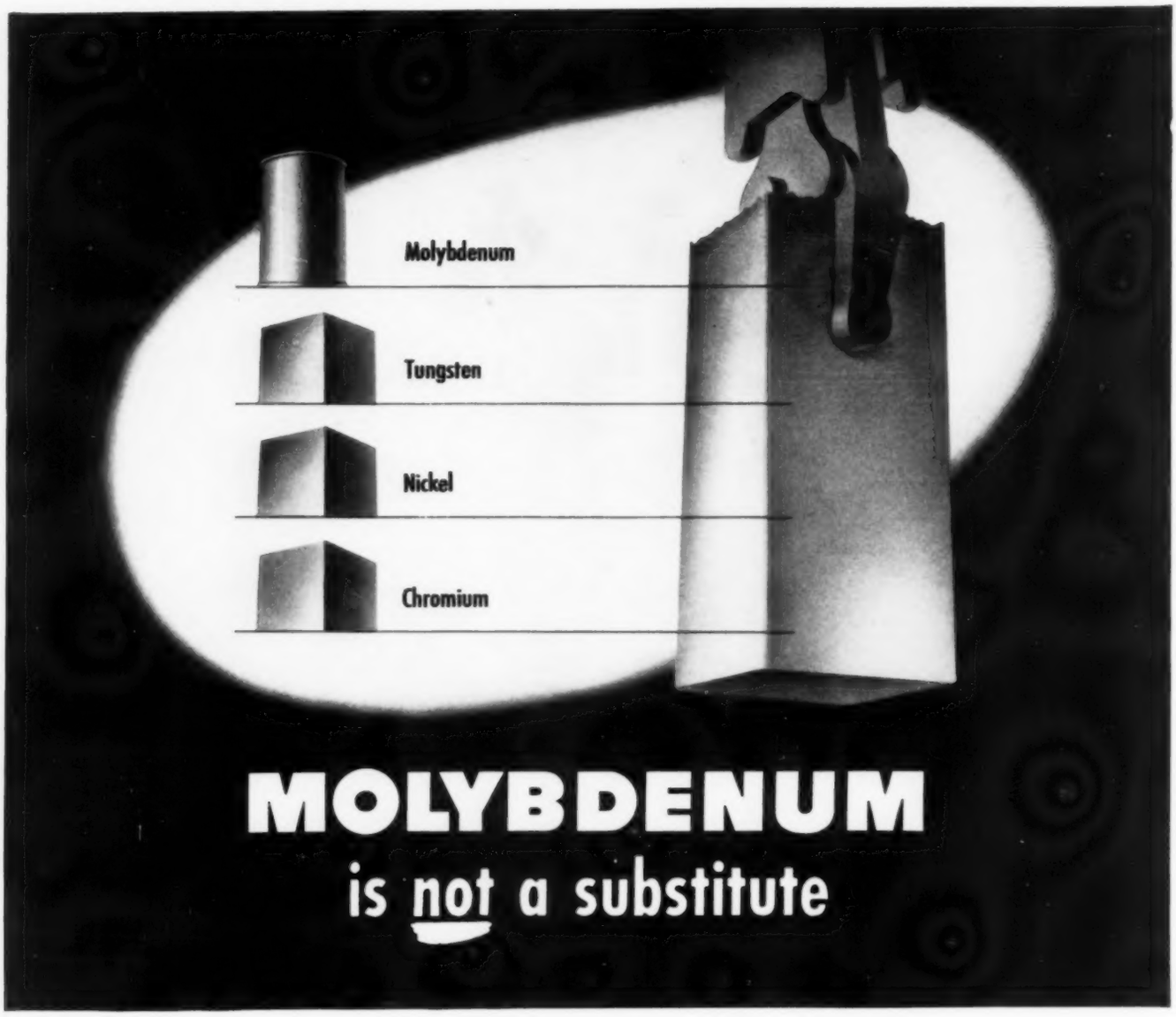
The variety of Norton abrasives and the variety of Norton bonding processes are of course important factors in this close fitting of Norton Wheels to the job but more important still is Norton Engineering Service. It is only in the hands of skilled engineers that this variety of abrasives and bonds can be utilized to full advantage.

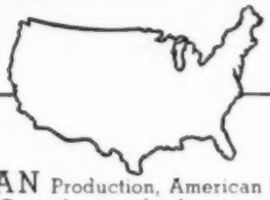
Norton engineers are prepared to study your cleaning room jobs and recommend just the wheels that you need for maximum production—the abrasives and bonds, the grains, grades and structures.

Take advantage of complete Norton Service — distribution, engineering, research — it can be more important to you now than ever.

NORTON COMPANY, WORCESTER, MASS.
New York Chicago Detroit Philadelphia
Pittsburgh Hartford Cleveland Hamilton, Ont.
W-852

NORTON ABRASIVES





AMERICAN Production, American Distribution, American Control completely integrated.
Mines: Tucson, Arizona; Questa, New Mexico.
Smelting and Refining Works: York, Pa., Washington, Pa.
Offices and Warehouses: Pittsburgh, New York, Chicago, Detroit, Los Angeles, San Francisco, Seattle.
Sales Representatives: Edgar L. Fink, Detroit; H. C. Donaldson & Co., Los Angeles, San Francisco, Seattle.
Ample stocks, sales facilities, technical advice available.

Molybdenum is not a substitute for any other metal, in the sense that it can be used precisely as they are, with identical results. For tungsten, in that sense, there is no substitute. Nor for chromium. Nor for manganese, or nickel, or any element of sovereign virtue.

Yet Molybdenum and some of these other alloying elements can be employed, each according to its own nature, for many exacting requirements, and physical properties can be developed that give entirely satisfactory performance.

Such a recourse is very important when some of the materials in question become scarce while others are still abundant.

Molybdenum can be obtained for all desired uses. The knowledge of what can be done with it has been greatly extended, and its possibilities go far beyond what had been supposed. New literature is available.

MCA

MOLYBDENUM CORPORATION OF AMERICA
GRANT BUILDING, PITTSBURGH, PA.

Foundry DEVELOPMENTS At Short Range

AT A PROMINENT Midwest foundry the cores for a sleeve type casting 5 inches diameter, 15 inches in length are green sand made on a core blowing machine. The sand shows a permeability of 60, moisture 5 per cent and green strength 8. The cores are supported in the mold by the usual print at each end and are reinforced by a fluted cast iron arbor 1 inch in diameter. A small rod is placed in one of the flutes and pulled out later to form a vent opening in the core. The lower half of the corebox is shoved under the machine. The upper half is attached to the blower plate. Sand is blown into the corebox through a single ¾-inch opening at the top center. The completed core is drawn out on a roller conveyor. The drag half of the flask is placed on the half corebox and the assembly is run under a roll-over device, clamped and turned over. The half corebox is removed and replaced by the cope. The mold is clamped and placed on a second conveyor which carries it past the pouring station and eventually to the shakeout.

* * *

A new and lighter shade of *machine tool gray* has been endorsed by the National Machine Builders' Association as a standard finish for machine tools. The color known as 7-B was selected after a vote showing most machine tool builders in favor of it, and that the trend among users was toward a lighter color. While the new lighter shade shows up dirt and fingerprints more easily than the old, it has a much better reflection value. One large user after repainting found a 33 1/3 per cent better light at working height

* * *

A simple and ingenious device in a foundry producing miscellaneous automobile castings pushes the snap flask molds from a conveyor on to the shakeout screen. As the molds come around a turn they come into contact with a wide steel bar set at an angle which guides them to the edge of the conveyor where they fall off by gravity. The sand falls through the screen and the castings, gates and sprues are removed by attendants who place them in tote boxes.

* * *

With increasing shortage of scrap, foundries are compelled to accept shipments containing materials which only a short time ago were considered quite undesirable—for example very rusty scrap. However, the experience of a Canadian foundry indicates that by adjusting melting practice, such material can be used. The scrap in question was very rusty steel rails which with regular procedure resulted in a black slag and dead metal. By increasing the limestone in the charge, the slag improved and the iron produced was once more of usual quality.

* * *

TRYING to distinguish persons and objects around us during a blackout may confront many of us before long, and it might be in order to call attention to certain products which in a large degree will reduce the hazards of blackout conditions. One method is the use of harmless and invisible near-ultraviolet radiations in combination with fluorescent compositions which are caused to glow by the so-called black light. A more recent development is a luminescent material in sheet form resembling oil cloth which is sold by the yard. The material claimed to be activated readily to luminescence by exposure to daylight, black light or intense artificial light from various types of electric lamps, emits light to a useful degree in a darkened room for many hours. It may be sewed, tacked, stapled, taped or cemented to other materials such as clothing, lighting fixtures, walls, ceilings, stairways, etc. to provide emergency illumination. With indoor use, the material is expected to last with little change for an indefinite period while with outdoor use the life expectation is from 6 months to a year.

* * *

A WELL KNOWN nonferrous metallurgist in discussing ways and means to conserve virgin copper and other metals by judicious modification of specifications to permit remelting gates and turnings which may be contaminated to some extent by other metals beyond the specified point. As a case in point he states:

"A typical example is the tremendous consumption of virgin copper in the cast bushing industry compared to the volume of finished product. For instance, aircraft and other war bushings are made largely of gun metal, 88-10-2 copper-tin-zinc or similar alloys. According to all war specifications these bushings must be made of virgin metal. When only 15 to 30 per cent of the metal cast results in finished product, obviously there is a heavy consumption of virgin metal as well as an unnecessary freezing of available copper in return material due to contamination of machinings and gates by lead from leaded bronze castings. The remedy is metallurgically simple for lead is the only contaminant of importance and has no detrimental effect on the alloy in small amounts. Thus, by raising the limit on lead from 0.25 per cent to 1.00 per cent, machinings and gates can be remelted, releasing a goodly amount of virgin copper."

FOUNDRY ACTIVITIES

GENERAL Steel Castings Co., Eddystone, Pa., and Granite City, Ill., recently purchased 14 large heat treating furnaces from the Selas Co., Philadelphia, for the complex sequential heat treatment of the new one-piece cast alloy hulls and turrets for the large and medium tanks being built by the United States army. The furnaces, mostly continuous in multiple batteries, are all direct fired by gas through a multiplicity of individual, adjustable ceramic radiant cups. Pilot operations leading up to the contract involved six similarly direct, radiant, gas-fired units up to 82 feet long by 11½ feet wide, some using as many as 104 radiant cup burners distributed over furnace sidewalls to achieve the required planned distribution of heat and high rates of direct heat transfer. One of the special features of the furnaces relate to the severe specifications covering heating uniformity and zoned full proportioning control. It is said that temperature variations which, in normal heat treating practice, would be considered insignificant, would, in the case of the new cast armor plate, produce nonuniform and unacceptable armor. Difficulty of meeting such specifications is augmented by the fact that individual hull castings for the new large tanks may weigh as much as 25,000 pounds, be as large as 22 feet long and 10 feet across, and vary widely in contour and cross-section at various points.

* * *

Hull Iron & Steel Foundries Ltd., Montcalm street, Hull, Que., will erect a foundry addition to cost approximately $50,000 with equipment.

* * *

F. Ferguson & Co. Inc., 1122 Clinton avenue, Hoboken, N. J., plans foundry alterations and additions estimated to cost $100,000.

* * *

Canton Malleable Iron Co., 2808 Thirteenth street, Canton, O., is starting erection of factory and office building.

* * *

Fairbanks-Morse & Co., Beloit, Wis., has let contract for one-story 30 x 187-foot shop addition.

* * *

American Brake Shoe & Foundry Co., Melrose Park, Ill., is building a one-story warehouse to cost $20,000. Construction is being undertaken to relieve crowded conditions. Space now used for warehousing will be made additional foundry and machine shop area.

* * *

Federal Mogul Corp., Detroit, has awarded contract for an addition to its factory to W. J. C. Kaufmann Co., Detroit.

* * *

Wellman Bronze Co., 6017 Superior avenue, Cleveland, estimates damage done by a recent fire at $100,000.

* * *

Peerless Aluminum Castings Co., 55 Andover street, Bridgeport, Conn., will let contract for one-story 65 x 144-foot steel foundry addition, to cost $40,000.

* * *

Pacific Foundry Co., 3100 Nineteenth street, San Francisco, plans foundry expansion and storage units. Estimated cost is $40,000.

* * *

St. Thomas Bronze Co. Ltd., First avenue and Wellington street, St. Thomas, Ont., will build a plant addition to cost about $50,000.

* * *

Bass Foundry & Machine Co., Fort Wayne, Ind., recently purchased by Thomas Simmons, Los Angeles, will begin expanding its facilities soon.

* * *

James Morrison Brass Mfg. Co. Ltd., 276 King street West, Toronto, Ont., has let general contract for a plant addition to cost about $60,000 with equipment.

* * *

Cleveland Electric Metals Co., 2391 West Thirty-eighth street, Cleveland, is rehabilitating its foundry which was recently damaged by fire. John W. Brown is president.

* * *

Watkins Inc., Wichita, Kans. is preparing preliminary plans for construction of a steel and foundry plant with about 250,000 square feet of floor space, to cost approximately $200,000.

* * *

Separation of the foundry and pattern division of the Buhr Machine Tool Co., Ann Arbor, from the parent concern and its incorporation as the American Pattern & Foundry Co., recently was announced by Joseph F. Buhr, president of both concerns. The separation was made so that the foundry and pattern department could do work for firms other than the parent company.

* * *

American Brake Shoe & Foundry Co., North Kansas City, Mo., is preparing plans for a one-story 70 x 100-foot foundry addition and a one-story 60 x 80-foot machine shop addition.

* * *

Hunter Foundry Co., 3547 South Morgan street, Chicago, recently established a group insurance policy for its employes with the Prudential Insurance Co. of America.

* * *

Chicago Foundry Co., 3720 South Kedzie avenue, Chicago, has added another shift to its operation, thereby increasing the production of steel castings from 300 tons to 600 tons per month. Eighty per cent of the company's production is for defense.

* * *

Central Pattern & Foundry Co., 3737 South Sacramento avenue, Chicago, now is erecting a large modern foundry on a site recently purchased and from which several old buildings have been removed. All new equipment has been ordered. The cost will be approximately $175,000. It is to be equipped with heat treating furnaces and X-ray equipment. This will double its present production facilities. The company also is operating a large permanent mold division for aluminum castings which recently has been completed.

* * *

Chicago Pneumatic Tool Co., Franklin, Pa., contemplates a 134 x 197-foot addition to its foundry and a 120 x 535-foot addition to its machine shop to increase manufacturing facilities for the company's compressor and diesel engine business. Foundry addition will include a new cleaning room 66 x 135 feet and installation of equipment to clean castings hydraulically. Addition to the core room will be 35 x 130 feet and installation of new equipment will include latest type core ovens and sand preparing equipment.

An assured Supply of
INDUSTRIAL X-RAY FILMS

Are you using industrial x-ray films in the manufacture of vital defense products? As the world's largest distributor of x-ray films, Picker carries in stock every standard make and size of fresh films at all times. Your order for a single dozen or 1000 dozen x-ray films will be shipped promptly. May we send you a catalogue and price list?

World's Largest Distributors of X-ray Films and Supplies

PICKER X-RAY CORPORATION
300 FOURTH AVENUE — PX — NEW YORK, NEW YORK
WAITE MANUFACTURING DIVISION, CLEVELAND, OHIO
OFFICES IN PRINCIPAL CITIES THROUGHOUT U. S. A. AND CANADA

LINING THE CUPOLA WITH FIRESTONE

By SIDNEY G. KOON

ONE of the most important uses for firestone is that of lining or daily patching in the melting zone of gray iron cupolas. The terms patching and lining are to some degree synonymous as in large continuous pour foundries the melting zone virtually is relined after each heat. It is first determined by experience what thickness will burn out during the run and the smallest necessary quantity of stone is used in making the repair. As a rule, it is best to skull out any small quantity of stone remaining in the melting zone after these long heats and a new lining then is applied, consisting of blocks perhaps 4 or 6 inches thick as may be determined.

STEARNS–MAGNETIC
MILWAUKEE

HARNESSING THE FORCES OF MAGNETISM

Stearns Magnetic Milwaukee represents an institution founded by R. H. Stearns that has grown from a humble beginning in a small shop to a great plant with extensive facilities for research and development.

Constant study and improvement of magnetic methods through excellent laboratory and engineering facilities to efficiently and economically apply the forces of magnetism for separation and other commercial purposes, including power transmission devices, has given Stearns Magnetic an enviable predominating position in the widespread use of magnetic equipment for all practical purposes.

Our complete engineering and laboratory facilities are at your service and you are invited to make use of them without obligation.

WRITE FOR BULLETIN 101
"THE HOUSE OF MAGNETIC MAGIC"

STEARNS MAGNETIC MANUFACTURING CO.
662 S. 28th St. Milwaukee, Wis.

Blocks or slabs are installed with the grain either vertical or horizontal and facing into the cupola. A standard stone size is 6 x 6 x 12 inches but any other convenient size may be used. Taking the size 6 x 6 x 12 inches as an example, such blocks may be laid with the grain horizontal in 12-inch lengths. This is usually done in large cupolas but where this does not provide sufficient joints for expansion, the blocks may be up-ended with the 12-inch dimension and the grain vertical.

Stone laid with grain exposed to the fire, either horizontal or vertical, gives best service.

Where thin slabs with horizontal grain are preferred for shorter heats, or to avoid a waste of material, they should be sawed on two sides across the grain. A typical size is 2 x 6 x 9 inches, the 2-inch dimension being between saws and the 9-inch dimension being laid vertically. Larger slabs of course can be employed.

Set With Grain Vertical

Another method frequently used, particularly in heats of 8 hours or less, is to lay the stone in the form of split slabs (not sawed) with the largest face toward the fire, that is to say with the grain vertical, but in this case parallel with the shell and not visible on the surface. While this is not the best method and presents the cleavage of the stone to the fire, it has certain advantages in heats that are not long enough to vitrify the stone. For example, the rough stone costs less and an average size slab may cover approximately one or more square feet of surface. The labor cost of laying is correspondingly reduced. In chipping the cupola after a heat, stone will not come away with the coke adhering to the lining.

These considerations do not alter the fact that the best practice in most foundries is to lay the stone with grain exposed, either horizontal or vertical, using rough or sawed slabs or blocks.

Mortar used in the joints should be selected carefully and should not be too high in alumina. Carelessly filled joints cause a great deal of trouble and should be avoided. Joints are approximately ¼-inch wide at the front or fire face and provide for expansion of the stone slabs in conjunction with sufficient backing behind the lining and next to the shell. An addition of sand may be made to joint mortar, care being exercised not to use too much. This takes care of excess alumina

in the fireclay. Hot setting mortars do not bond the lining below 2000 degrees Fahr. and therefore are somewhat of a weakness in the lining up to that temperature as slag will attack at this point.

In lining bull or crane ladles the rock is sawed two sides across grain in 1½ x 4½ x 9-inch tiles, 1½ inches between saws. The grain runs parallel with the 4½-inch dimension. Another use for firestone is in the manufacture of slag hole blocks. These are sawed four sides across grain, 8 x 8 x 10 inches or any other required size. one or two holes as specified being drilled across the grain.

Stone is a raw material, fired or burned in during the early stages of operation. During the process of firing, the well known quartz inversions take place, resulting in expansion and loss of specific gravity. The curve of expansion is quite uniform and the total linear expansion from room temperature to temperatures ordinarily reached in cupolas is 1.8 per cent. The specific gravity of the three major modifications of silica is quartz, 2.65; crystobalite 2.33; tridymite, 2.27. The quartz contained in a stone refractory, particularly on the surface, inverts from alpha to beta quartz to crystobalite to tridymite according to applications and degree of temperature.

Shows Slight Wear

Conductivity of a refractory is affected through absorption from inclusions in gases or by slag which results in formation of surface silicates. A contributing factor, particularly in respect to the high resistance of slag erosion is the formation of these silicates on the surface of the stone with iron, lime, magnesium, etc. Though silica is a metallurgical acid, it will resist basic slag conditions for this reason and because as a result the surface pores are sealed against further slagging. During the early stages of a heat, wear on a lining may be excessive, but this diminishes as the heat progresses until increase in diameter is almost negligible. Depth of vitrification of a lining during a given period is dependent somewhat on insulation or its equivalent thickness in lining. In this connection, the question of advisability of painting the surface walls with a fine silica flour mixed with a catalyst to aid in inducing early glazing, is of interest.

Factors affecting life of a firestone lining include duration of heat, temperature, ash content of coke, velocity and during the blast, material charged and nature of the flux. Others are the importance of using seasoned stone, control of expansion of the lining and proper application

"MOVE ON!"

Yuh don't belong here!

THE guard outside your gate may protect your plant from dangerous aliens, spies and saboteurs. But—how about the destructive enemies ALREADY INSIDE?

DUST is one of the worst of these. It attacks machines, products and the efficiency of workmen —without warning—striking steadily and continuously—deducting its costly damages DAY AFTER DAY FROM YOUR PROFITS.

PUT AN END TO THIS DUST LOSS RIGHT NOW! Protect your plant, products and production by eliminating dust—with Pangborn all-metal frame, cloth screen Dust Collectors. A size and type for every requirement. Economical to install. Costs practically nothing to operate and maintain.

For a clear presentation of Industrial Dust Control for Defense—"come to Pangborn" today.

PANGBORN

WORLD'S LARGEST MANUFACTURER OF DUST COLLECTING AND BLAST CLEANING EQUIPMENT

PANGBORN CORPORATION · HAGERSTOWN, MD.

of lining or patching with reference to expansion.

Probably the one single factor in trials and use of firestone having the greatest effect on service of that material is the degree of seasoning to which it has been subjected. This has been confirmed by experience in foundries and steel plants where it has been determined by many trials that well seasoned stone gives noticeably longer life than green stone.

Stone freshly quarried is soft and small particles can readily be crushed between the fingers; and sawed slabs will bend slightly when lifted. In a few hours in warm, dry weather, this condition disappears and stone becomes rigid. This is caused by the evaporation of the original quarry sap of deposition which is a solution of silica and the consequent precipitation of colloidal silica in the interstices between the crystals, thus further cementing the grains comprised in the matrix of the material.

Stone continues to harden for at least a year. For all practical purposes seasoning from 30 to 90 days in average summer or fall weather is sufficient; the latter is to be preferred. Stone will season out of doors in winter or summer, obviously not as rapidly in winter. If rock is closely piled outside, so that air cannot circulate through it, seasoning will be delayed in rainy weather but after the sap has drained or dried out, subsequent wetting has no particular effect and seasoning will continue. Assuming that a pile of stone has been fairly well seasoned outside in fall or winter, but is wet by a recent rain when wanted, a quantity sufficient for immediate requirements should be brought under cover in a warm, dry room and dried before using, or it can if seasoned be dried with a low fire (below 200 degrees) after installation in a lining.

Drying out moisture acquired subsequent to seasoning should be understood to be an operation separate and distinct from seasoning, although the initial phase of the latter is the drying out or draining of the sap present when quarried.

It is of course desirable where there is available storage space, to store under cover but this is by no means essential since a very little observation will enable any operation to distinguish seasoned material. The importance of using well seasoned rock cannot be over emphasized.

Will Expand When Heated

Firestone will expand when heated and this is taken care of by the joints and backing. If individual slabs or blacks are too long horizontally around the cupola or in other furnaces or vessels, this will reduce the number of joints and consequent provision for expansion.

If this is carried to excess, spalling will result, with corresponding unnecessary waste of stone. A good rule to follow is to have the vertical joints 6 inches to 8 inches apart except in the larger cupolas. Too much sand in the jointing mortar should be avoided, as the expansion of same reduces provision in the joints which should be left for the expansion of the lining itself.

If more than the necessary quantity of limestone was consistently used in previous practice, this would be noticeable when changing to stone, as the silica composing the stone would be attacked to some extent by excess lime over that necessary to unite with the silica and other impurities in the charge itself. It is advisable to keep this in mind as still longer life may be obtained from the linings without detriment to the iron if limestone is properly adjusted.

Where a slight reduction in flux results in a slag not sufficiently heavy, we have as an alternative the addition of a few shovels of sand

Everybody Can't

BUILD BATTLESHIPS

Someone has to manufacture the rivets. While big fellows build our tanks and planes, someone has to make the nuts and bolts.

Now, Since Pearl Harbor, America sees more clearly than ever, the fundamental importance of men in metal making castings . . . parts which in themselves seemed insignificant before.

Everybody can't build battleships. We have to be content with making only better chaplets, for you on "all out" schedules making bigger things. But we share your pride in your accomplishments, believing our small contribution helps. We shall continue to supply you with chaplets meeting all requirements of Foundrymen who "demand the best".

Milwaukee Thread Stem Chaplets
Schmitz Chaplets · Standard Radius Chills
Patented Adjustable Radius Chills · Other Foundry Supplies

to the charge. This would have the same effect in establishing an equilibrium between basic and acid components of the slag as would the reduction of quantity of limestone used but would maintain a heavier bed of slag should this be requisite to clean the iron.

If the blast is high, an increase in iron oxide in the slag may be noticed. Slag will be dark blue in color and probably foamy. Slags of this nature are always detrimental to the lining while those of a grayish green color, hard and glassy, present no problem. A viscous slag often causes oxidation of the iron, tends to freeze by contact with the blast and this results in bridging in the melting zone. Blast is restricted to channels and increased in velocity the melting zone. Blast is restricted with detrimental results to the lining. A viscous slag also fails to dilute a number of constituents which it contains and in concentrated form prior to dilution, these inclusions may be such as to have a corrosive action on the lining.

Blast under too high a pressure tends to oxidize iron. The resultant iron oxide will attack the lining. A high blast pressure will abrade a stone or any other lining so that it does not have a chance to vitrify or form ferrous or calcium silicates on the surface. These are prime requisites for long service of a stone lining. Concentrations of limestone and of small scrap in a single charge will increase blast pressure and divert the flow of air in the stack. Blast is thus deflected against the various parts of the lining, causing holes which require extra labor when patching.

Formation of steam in or behind a stone or other lining may loosen or damage it, especially near the top of the melting zone. Temperatures should not be raised too rapidly if there is evidence of formation of steam.

This article is taken from a paper presented by the author at the annual convention of the American Foundrymen's Association held in New York during the week of May 12.

THE EDITORS.

Sponsors Program

The program, "Elmer Davis and the News" over a nation-wide hookup of the Columbia Broadcasting System now is sponsored by Johns-Manville. The program is heard each evening, Monday through Friday at 8:55 p.m. Eastern standard time.

How to Keep Wage and Hour Records Under the Fair Labor Standards Act of 1938 is the title of a 31-page bulletin recently issued by the Wage and Hour division, U. S. Department of Labor, Washington.

Foundry Equipment Orders Increase

Index of foundry orders for December, 1941, according to a report of the Foundry Equipment Manufacturers Association, Cleveland, was 481.2 as compared with 408.5 in November. Index of orders for new equipment was 505.3 and for repairs 408.7. The index of 100 represents the monthly average of reported sales to total working industries during 1937-38-39.

Service Records Are Recognized

Majestic Mfg. Co., St. Louis, recently presented service emblems to 117 employes in recognition of service records ranging from 5 to 49 years. The illustration below shows J. E. Russell, left, president of the company, presenting the diamond service emblem to Gus Weise, oldest employe with 49 years continuous service. The interested onlooker at the right is Charles Mindermann, pattern maker who boasts of 47 years of continuous service. For a number of years the Majestic Mfg. Co. operated a foundry.

Book Review

Handbook of Chemistry, by N. A. Lange, fabrikoid, 1935 pages, 5⅜ x 7¾ inches, published by Handbook Publishers Inc., Sandusky, O., price $6.

This volume is the fourth edition of a well known work, and contains over 100 pages more than the previous edition. It is a valuable compendium of information particularly for the chemist, chemical engineer, physicist, etc. The present book includes tables not in the third edition relating to synthetic rubbers, correction of boiling point for pressure, calculation of boiling point of organic compounds, qualitative spectrographic analysis, sensitive lines of the elements, Hammond's cuprous oxide and copper equivalents of sugars, conversion of specific gravity of density, azeotropic mixtures, tank and pipe capacities, logarithms of factorial n. factorials, and binomial coefficients.

Tables extended or completely rewritten include those on description of elements, changes in atomic weights from 1894 to 1941, physical constants of alkaloids, physical contents of glucosides, physical and chemical properties of resins, calculations of refractive index, electrometric determinations of hydrogen ion concentration, laboratory solutions, gravimetric factors and their logarithms, molar elevation of the boiling point, phenol coefficients of germicides and antiseptics, photographic formulas, probable values of physical constants, table of integrals, and squares, cubes, square roots and cube roots.

The book is printed on non-glare paper, and the size and style of type used make for easy reading. A good index aids in locating the references.

Allis-Chalmers Mfg. Co., Milwaukee, recently has published a 54-page booklet entitled, "Patent Background for Engineers." The articles presented in this booklet originally were published in the Allis-Chalmers Electrical Review.

Left to right—J. E. Russell, Gus Weise and Charles Mindermann

Obituary

WILLIAM J. REARDON, 71, president, National Alloys Co., Detroit, died in that city Dec. 24. He was born in Paterson, N. J., and in 1903 went to work for the Westinghouse Electric and Manufacturing Co. and remained with that company until 1916. During his tenure of office he introduced American foundry methods for his company in England and France. From 1916 to 1919 he was in charge of the foundry of the Rome Manufacturing Co., Rome, N. Y. From 1919 to 1921 he was foundry superintendent of the Detroit plant of the Aluminum Co., of America. In 1921 he organized the National Alloys Co., Detroit.

* * *

Robert B. Hall, 46, traffic manager, Massey-Harris Co., Racine, Wis., died Dec. 26 in that city.

* * *

A. T. Hunt, 63, superintendent of plant engineering, Hawthorne works, Western Electric Co., Chicago, died at his home in LaGrange, Ill., Dec. 18, from a heart attack. Mr. Hunt joined the company in 1924 as a service engineer in connection with the building of the Kearny, N. J., plant. In 1930 he was made superintendent of that plant and later was transferred to the Hawthorne.

* * *

Jacob S. Goldman, 64, president, United Brass & Aluminum Co., Port Huron, Mich., died at his home in that city Jan. 2, after a brief illness.

* * *

George A. Thobaben, 72, for many years foreman, pattern shop, Eberhard Mfg. Co., Cleveland, died Dec. 14 at his home in that city.

* *

Lamar S. Peregoy, 54, president of the Sivyer Steel Casting Co., Milwaukee, died Jan. 2 at his home in that city. Mr. Peregoy was connected with the Sivyer company since its inception and served in various capacities. He joined the company in 1909 as office and production manager, in 1917 was elected secretary, and in 1924 took over more of the active management of the plant. He was elected vice president in 1926, and two years later was appointed general manager. When the Sivyer Steel Casting Co. merged with the Nugent Steel Castings Co., he became president and general manager of the new organization. Mr. Peregoy was a director of the American Foundrymen's Association from 1935 through 1937. He also served on the board of directors of the Steel Founders Society of America.

Lamar S. Peregoy

* * *

Thomas H. Morcom, 57, general factory superintendent, General Railway Signal Co., N. Y., died Jan. 11 in Rochester. Mr. Morcom had held that position since 1931.

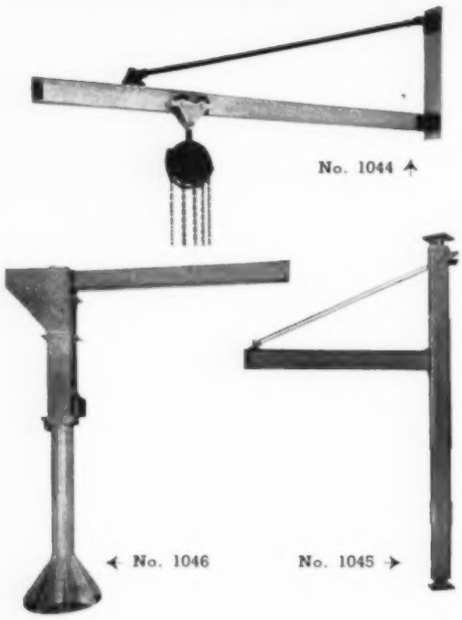
* * *

Charles Tuttle Clark, 70, president, Bay City Foundry Co., Bay City, Mich., died recently at Mercy hospital in that city, following a month's illness. Mr. Clark was a native of Cedarville, N. J., and was

Need a GOOD

JIB CRANE

in a HURRY?



■ Easily and quickly installed in your foundry to speed up production. CHICAGO jib cranes, constructed in our own plant to your specifications, are unusually well-made and moderately priced.

WALL TYPE—No. 1044

■ This swinging bracket jib crane is a popular unit. For hand or electric hoist, it comes in capacities of ½ to 3 tons and up to 20 ft. radius.

MAST TYPE—No. 1045

■ Ideally suited for capacities to 5 tons. For either hand or electric hoist. Complete circle swing. Made for your requirements.

PILLAR TYPE—No. 1046

■ A strong unit with self-supporting jib crane with complete circle-swing. Capacities ½ to 2 ton with 20 foot radius. Built to last.

Special service cranes also designed for any unusual foundry need.

CHICAGO Knows A Foundry's Problems

■ We have specialized in the design and construction of foundry materials handling equipment for many years—it will be worth your while to let CHICAGO submit bids on your next job, large or small.

SEND FOR OUR COMPLETE CATALOG ➡

CHICAGO TRAMRAIL COMPANY

2910 CARROLL AVE. Phone KEDzie 7475 CHICAGO, ILL.

a division manager of the E. I. Dupont de Nemours Co. plant at Bay City, for 16 years prior to operating the same plant as owner.

* * *

Carl F. Rosenthal, 64, youngest of four brothers who founded the Rosenthal Corn Husker Co., Milwaukee, died Dec. 26. Mr. Rosenthal was vice president of the firm which was founded in 1896.

* * *

Raymond E. Stoney Sr., 53, president and general manager, Stoney Foundry Engineering & Equipment Co., Cleveland, was killed recently through accidental carbon monoxide poisoning at his home in Lakewood, O.

* * *

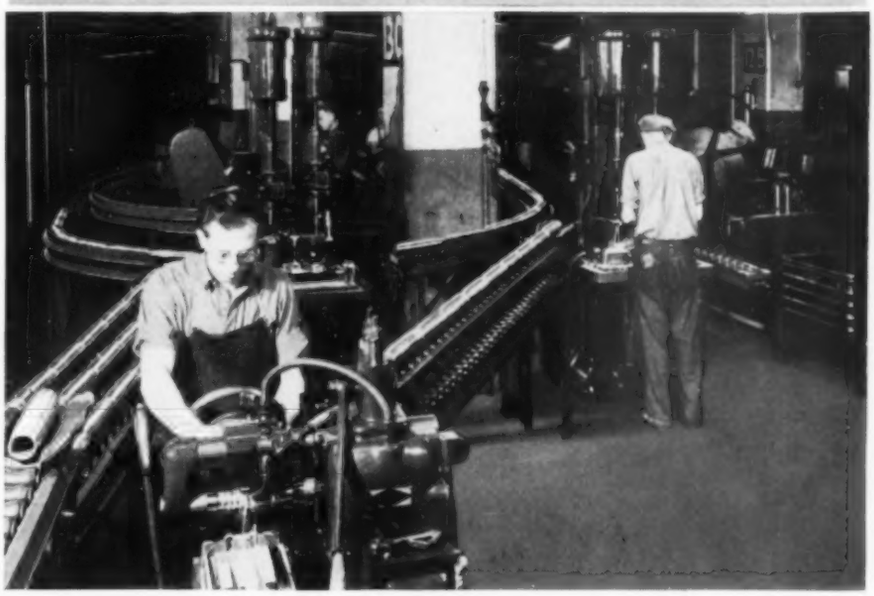
Harry A. Trebing, 64, former analytical chemist, Corrigan, McKinney Steel Co., now part of Republic Steel Corp., Cleveland, died unexpectedly Dec. 29, at his home in Baltimore. For the past 10 years Mr. Trebing had been manufacturers' representative in the East for companies including the Smith Facing & Supply Co., Cleveland.

* * *

Arthur Aigeltinger, 58, vice president, American Brake Shoe & Foundry Co., New York, died recently in Baltimore. Mr. Aigeltinger was appointed assistant to the president of American Brake Shoe in 1929 and was elected vice president in 1934. In recent years he had been in charge of patents, metallurgical research and personnel welfare problems. Mr. Aigeltinger was born in New York and was graduated from Columbia University in 1907. A year later he went to work for the Manganese Steel Rail Co., holding successively the positions of chief engineer, vice president and president. In this period he helped develop the rolled manganese steel helmet used in the World war. In 1918 he became president of the American Malleables, a subsidiary of American Brake Shoe, and served as president from 1922 until its dissolution in 1936.

Parsons Engineering Corp., Cleveland, which doubled its capacity in 1941, again is adding to its facilities. New plant and office located at Seventy-ninth and Woodland avenue, are equipped with modern machinery for high speed production and handling facilities for heavy equipment. Officers of the company are: S. S. Parsons, president, Lawrence J. Holzman, vice president and secretary and F. C. Morey, treasurer. Mr. C. C. Peck, formerly with Lincoln Electric Co. and Contract Engineering Corp. recently has been made a vice president in charge of production.

STANDARD CONVEYORS ... VITAL "SUPPLY LINES" TO PRODUCTION MACHINES



CONVEYORS—planned and built by Standard—are a basic part of well organized production. They are the "arterial highways" of plant transportation—handling incoming material—work in process—keeping high-speed production machines well supplied—moving materials, parts, finished products from department to department. By cutting short handling time, eliminating repeated handling, avoiding wasteful waiting, they help to make manpower and man-hours count effectively in increased production.

Conveyorize To Meet Today's Need for Speed:

Your production and handling operations can be "conveyorized" with substantial savings of space, time, and costs. Send for booklet F-2 "Conveyors by Standard"—a useful reference book on conveying and conveyors, contains many examples of conveyor installations, shows types of conveyors best suited to various units, parts, materials, products and commodities.

STANDARD CONVEYOR COMPANY
General Offices: North St. Paul, Minn.
Sales and Engineering Offices in Principal Cities

FIRST FOR FASTER PRODUCTION

"THE STANDARD OF VALUE"
Standard CONVEYORS

TO SPEED PRODUCTION FOR VICTORY

(*Continued from page* 61)

for the welfare of their guests during convention week, April 20 to 24. The local convention committee members, appointed by Chapter President Frank J. Dost are listed below:

General Committee — General Chairman Frank J. Dost, Sterling Foundry Co., Wellington, O.; General Vice Chairman John H. Tressler, Hickman, Williams & Co.; General Secretary Jack Lathrop, THE FOUNDRY, and General Treasurer Russell F. Lincoln, Osborn Mfg. Co.

Ladies Committee — Chairman Sterling Farmer, Sand Products Corp.

Banquet Committee — Chairman Leon F. Miller, Osborn Mfg. Co.; Vice Chairman W. L. Seelbach, Forest City Foundries Co.; J. H. Lansing, Malleable Founders' Society and H. A. Schwartz, National Malleable & Steel Castings Co. (This is an American Foundrymen's Association project, and the local committee is to assist as requested.)

Transportation Committee—Chairman H. F. Roberts, Williams & Co.; Vice Chairman B. F. Lambert, Diamond Alkali Co.; Clay Hellwig, Kerchner, Marshall & Co.; E. J. Metzger, Cleveland Quarries Co., and George Walton, Madison Foundry Co.

Hotel Committee—Chairman Tom Johnston, Republic Steel Corp.; Vice Chairman J. C. Maher, The Ohio Foundry Co.; H. L. McKinnon, C. O. Bartlett & Snow Co.; Wayne Stetson, secretary, Cleveland Convention Bureau; M. G. Thomas, City Foundry Co., and E. C. Zirzow, National Malleable & Steel Castings Co.

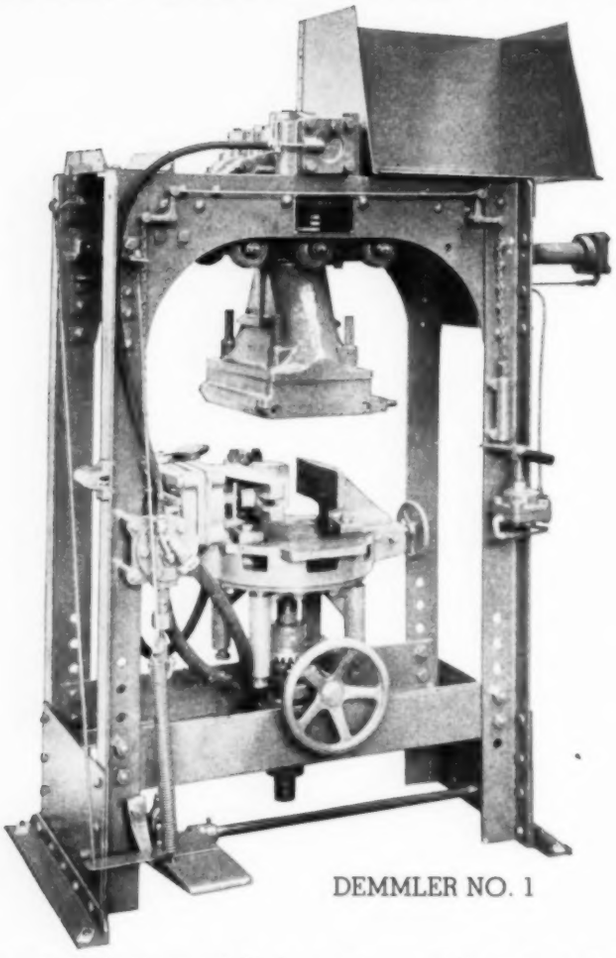
Publicity Committee—Chairman Edwin Bremer, THE FOUNDRY; Vice Chairman R. C. Wellman, THE FOUNDRY; George Birdsall, *Steel;* B. W. Corrado, *The Iron Age*, and L. E. Jermy, *Machine Design.*

Finance Committee — Chairman Ray Fleig, Smith Facing & Supply Co.; Vice Chairman Homer Britton, Cleveland Co-Operative Stove Co.; Frank Barton, Fulton Foundry & Machine Co.; J. H. Bruce, Bowler Foundry Co.; R. W. Hisey, Osborn Mfg. Co.; F. W. Pascoe, Westinghouse Electric & Mfg. Co.; Charles Seelbach, Forest City Foundries Co.; F. S. Wellman, Wellman Bronze & Aluminum Co. and R. H. West, West Steel Casting Co.

Welcoming Committee—Chairman J. J. Witenhafer, Lake City Malleable Co.; Vice Chairman F. A. Stewart, National Malleable & Steel Castings Co.; C. A. Barnett, Foundry Equipment Co.; L. B. Brewster, W. W. Sly Mfg. Co.; Jack Cleary, Sand Products Corp.; W. C. Corbeau, National Malleable & Steel Castings Co.; E. R. Crosby, Smith Facing & Supply Co.; A. C. Denison, Fulton Foundry & Machine Co.; Pat Dwyer, THE FOUNDRY; F. A. Ebeling, W. W. Sly Mfg. Co.; B. D. Fuller, Whitehead Bros.; C. C. Gibbs, National Malleable & Steel Castings Co.; H. S. Hersey, C. O. Bartlett & Snow Co.; G. J. Leroux, National Malleable & Steel Castings Co.; W. C. Manwell, Fulton Foundry & Machine Co.; A. B. Norton, Aluminum Co. of America; L. W. Olson, Ohio Brass Co., Mansfield, O.; B. G. Parker, Youngstown Foundry & Machine Co., Youngstown, O.; H. A. Reece, Meehanite Metal Corp.; L. P. Robinson, Werner G. Smith Co.; C. A. Schmidle, Republic Steel Corp.; A. M. Siess, W. S. Tyler Co.; F. G. Smith, Osborn Mfg. Co.; W. G. Smith, Werner G. Smith Co.; M. J. Sweeney, Allyne-Ryan Foundry Co.; Milton Tilley, National Malleable & Steel Castings Co.; Arthur Tumpach, Ferro Machine & Foundry Co.; S. C. Vessy, W. W. Sly Mfg. Co.; F. S. Wellman, Wellman Bronze &

★ ★ ★ SINCE 1911 ★ ★ ★

DEPENDABLE **CORE BLOWING** EQUIPMENT



DEMMLER NO. 1

This unit designed especially for small core work such as plumbing goods, electrical fittings, stove burners, valves and small pipe fittings. Ideally suited to quantity core production on all types of small brass, malleable, and gray iron work. Detailed specifications on this or other models on request . . . a type and size for every core blowing need.

WM. DEMMLER & BROS.
KEWANEE, ILLINOIS

CORE BLOWERS *Exclusively*

Aluminum Co.; R. R. West, West Steel Casting Co.; J. L. Wick Jr., Falcon Bronze Co., Youngstown, O., and M. W. Zeman, Osborn Mfg. Co.

N. E. O. Night Committee—Chairman W. E. Goebert, Bowler Foundry Co.; Vice Chairman E. M. Follman, Griffin Wheel Co.; Milo Barrett, Chandler & Price Co.; C. M. Beattie, Lake City Malleable Co.; J. C. Beattie, Fulton Foundry & Machine Co.; G. L. Bierly, Mansfield Brass Foundry Co., Mansfield, O.; G. A. Boesger, W. W. Sly Mfg. Co.; H. F. Bradway, Henry Furnace & Foundry Co., Medina, O.; C. F. Brecknock, Lorain Castings Co., Lorain, O.; C. W. Briggs, Steel Founders' Society of America; Homer Britton, Cleveland Co-Operative Stove Co.; J. V. Brost, Brost Pattern Works; E. W. Brown, Union Metal Mfg. Co., Canton, O.; F. C. Cech, Cleveland Trade School; Walter Chatfield, Fate-Root-Heath Co., Plymouth, O.; H. J. Colby, Fanner Mfg. Co.; G. M. Cover, Case School of Applied Science; Angelo Dublo, Sterling Foundry Co., Wellington, O.; H. A. Dunphy, Pitcairn Co., Barberton, O.; J. E. Dvorak, Eberhard Mfg. Co.; R. W. Eichenberger, Acme Foundry Co.; W. J. Feth, Forest City Foundries Co.; W. W. Firestone, Ashland Malleable Co., Ashland, O.

F. J. Fredriksen, Westinghouse Electric & Mfg. Co.; J. B. Freer, Machined Steel Casting Co., Alliance, O.; D. J. Gluntz, Gluntz Brass Co.; J. G. Goldie, Cleveland Trade School; H. C. Gollmar, Elyria Foundry, Elyria, O.; Fred Grondie, City Foundry Co.; Don Gurney, Warner-Swasey Co.; Joseph Hanks, Taylor & Boggis Co.; E. J. Hedlund, Urick Foundry Co., Erie, Pa.; E. F. Hess, Ohio Injector Co., Wadsworth, O.; J. B. Heisler, A. C. Williams Co., Ravenna, O.; R. S. Hoffman, Hoffman Foundry Supply Co.; J. W. Horan, Sandusky Foundry & Machine Co., Sandusky, O.; E. M. Horkan, East Technical High School; Louis Klein, Crucible Steel Casting Co.; D. Lansdowne, West Steel Casting Co.; J. H. Lansing, Malleable Founders' Society; W. O. Larson, W. O. Larson Foundry Co., Grafton, O.; William Love, Colonial Foundry Co., Louisville, O.; W. C. Manwell, Fulton Foundry & Machine Co.; Harvey Marette, National Metal Abrasive Co.; D. J. McAvoy, Grabler Mfg. Co.; E. A. McDonald, Berted Foundry Co., Columbiana, O.; E. N. McKelvey, Otis Steel Co.; H. L. McKinnon, C. O. Bartlett & Snow Co.; H. S. McKinnon, McKinnon Iron Works, Ashtabula, O.; George McNab, Hill-Acme Co.; E. J. Metzger, Falcon Bronze Co., Youngstown, O.; C. J. Miller, Fremont Foundry Co., Fremont, O.; P. R. Mooren, Meech Ave Foundry; E. Moyer, Ohio Cultivator Co., Bellevue, O.; H. C. Nicholas, Quality

New IMPROVED
LONG-LYFE NOZZLE
SCORES BIG HIT!
EXCEPTIONAL LONG LIFE and LOW HOURLY COST MADE POSSIBLE BY New CERAMIC Insert OF NEARLY DIAMOND HARDNESS
NEVER Before in all our experience has a product met with such immediate and wholehearted acceptance as the New low-priced American-Heanium Long Lyfe Nozzle—announced for the first time in this magazine last month.
The reasons are plain: First, buyers know from experience that they can place complete dependence on products bearing the American name; Secondly, there is no longer a valid reason for paying $20 to $40 for any nozzle when you can buy long life, low hourly cost, and exceptional blasting efficiency in an American-Heanium Nozzle for as little as $8.00.
If you are interested in making important savings on your nozzle purchases and on your blast cleaning operations don't delay in writing for complete facts about this unusual nozzle value—ask for Bulletin 17.
AMERICAN FOUNDRY EQUIPMENT CO.
505 S. Byrkit St. Mishawaka, Indiana
Only $8.00 EACH F.O.B. FACTORY FOR 3/8" SIZE AND UNDER
AMERICAN-HEANIUM
LONG-LYFE NOZZLES

Castings Co., Orrville, O.; H. M. Oehling, National Malleable & Steel Castings Co.; C. W. Ohly, Thompson Products, Inc.; F. J. O'Patrny, Frederick B. Stevens Co.

B. S. Parker, Youngstown Foundry & Machine Co., Youngstown, O.; B. R. Pearse, Atlas Foundry Co.; J. J. Potts, American Steel & Wire Co.; J. V. Proshek, Cuyahoga Foundry Co.; W. E. Rayel, Werner G. Smith Co.; E. T. Remy, Schill Mfg. Co., Crestline, O.; Marcel Reyman, Atlantic Foundry Co., Akron, O.; S. P. Schloss, Superior Foundry Co.; C. A. Schmidle, Republic Steel Corp.; M. B. Schramm, Cuyahoga Heights School, Cuyahoga Heights, O.; C. C. Scott, Coe Mfg. Co., Painesville, O.; C. H. Shurmer, Norwalk Foundry Co., Norwalk, O.; A. M. Siess, W. S. Tyler Co.; A. R. Silver, Quaker City Foundry Co., Salem, O.; A. D. Smith, Bethlehem Steel Corp.; E. W. Spade, Champion Hardware Co., Geneva, O.; George Stellman, Johnston & Jennings Co.; F. A. Stewart, National Malleable & Steel Castings Co.; O. S. Stewart, Cleveland Metal Abrasive Co.; M. J. Sweeney, Allyne-Ryan Foundry Co.; W. A. Thomas, Kilby Mfg. Co.; H. J. Trenkamp, Ohio Foundry Co.; John Vickers, Gray Iron Founders' Society; J. E. Wagner, American Steel Foundries Co., Alliance, O.; George Walton, Madison Foundry Co.; W. M. Weil, National Smelting Co.; Gordon Wilsea, Parker-Street Castings Co.; Frank Wisehan, Ferro Machine & Foundry Co.; F. L. Wolf, Ohio Brass Co., Mansfield, O.; W. L. Woody, National Malleable & Steel Castings Co., and M. W. Zeman, Osborn Mfg. Co.

Castings on the move

Whisk them through the Foundry;
Zip them through the Cleaning Room.

Use the following to shorten long jobs and eliminate unnecessary ones.

LION BINDER - A strong, fast drying paste; tie wires not needed. A strong binder that bakes very fast.

EASY CLEANER CORE COMPOUND - Makes cores that clean out of the castings readily.

VULCAN BLACKING - Can be adapted to swift application; gives good surface, cleans speedily.

DUST-ON FACING - Shake it on green sand molds, close and pour. No tooling. Fast cleaning.

SUPERIOR PLUMBAGO - Rubs in immediately; doesn't "lift" the sand - - peels beautifully.

SILKOTE - Paint or spray on steel foundry cores, dry sand molds and skin dried work. Adaptable to fast application. Casting surfaces are really clean.

Manufactured only by

J. S. McCORMICK CO.
PITTSBURGH, PA.
FOUNDRY FACINGS • SUPPLIES • EQUIPMENT

Technique Used on Large Casting

(*Concluded from page* 71)

placed in four parallel rings around the core assembly, were used to keep the port cores in place while the mold was poured. The complete core weighed about 5500 pounds, and contained 200 pounds of cast arbors and 2300 pounds of reinforcing steel rods.

After the pouring operation, the assembly was cooled and placed in a water blast to remove all cores. Following a drying period, the casting was chipped and cleaned by shot blast.

Book Review

Testing and Inspection of Engineering Materials, by Harmer E. Davis, George Earl Troxell and Clement T. Wiskocil, 372 pages, published by the McGraw-Hill Book Co. Inc., New York, for $3.50.

This is a preliminary edition for engineering defense training courses in which the authors endeavor to provide a general treatment of the problems of testing with specific reference to mechanical testing of engineering materials and to the establishment of principles for the inspection of these materials. In preparing this study of testing as a subject by itself, the authors have gathered together in condensed form the more important and pertinent information on testing that is contained in the new voluminous periodical literature and in the specifications published by a variety of organizations. A classified list of references is appended. A brief summary of properties of materials in estimating load schedules, for comparison with results of student testing, etc., is given as an appendix. The text is divided into two sections, one devoted to building up the general concept of testing, the other to provide, in such form as to be applicable to methods of conducting common tests.

International Nickel Co. Inc., New York, has moved the Detroit office of its Development and Research division from the tenth floor to the eighth floor, Room 8-207, General Motors building, Detroit.

PLANNING THE NONFERROUS FOUNDRY

(*Continued from page* 70)

room is something that should have the consideration of those who have studied the subject of ventilation thoroughly. The obnoxious fumes and gases that are present in the core room atmosphere are frequently heavy enough so that they do not necessarily rise up to ventilators in the roof with the same satisfactory results that they would if they were not so heavy. Furthermore, the increased weight of these fumes means that as they cool they separate from the rest of the atmosphere and fall back to the level of the working space in spite of the upper draft of the rest of the air in the room.

Illumination is, of course, best if it is natural but in spite of the best natural illumination, artificial illumination also must be provided since many days are dark enough so that artificial illumination must be added to the natural illumination that is available. Since core making is work that must be done accurately and also since employes may be hurt if they do not have adequate light to insure safe operation of the mechanical devices in the core room the best artificial illumination available is the cheapest in the long run.

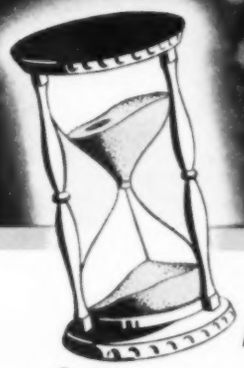
Consult Engineers

With the increasing number of types of lamps and illuminating units available today the designing engineer who is planning the new foundry or is modifying his old one will do well to get the help of illuminating engineers. They are versed in the proper application of the modern illuminating equipment and the measurement of available light and can aid effectively in planning artificial illumination equipment for the foundry and core room.

A well planned core room is one in which the supplies are brought in with a minimum expense from the storage departments to a point where they progress as they are fabricated to that point where they become completely finished cores. This means that the core sands, core binders and other supplies should reach the core room at that point where the sand mixers are provided and from the mixers these compounded core mixtures should be fed with a minimum of labor and expense to the coremakers and their respective core machines. These latter should be located where they can feed their output of cores to the drying ovens without undue handling and with a minimum amount of delay and labor.

Selection of equipment, such as core machines, core ovens, core cutting off machines etc. is something that should be considered most carefully for there are a large variety of each of these different types of equipment. Each has its particular application where it can serve best. For example, in the question of core ovens there is the drawer type which is excellent for small cores and cores having the capacity of rapid drying. The car type is available for cores having large volume that require extended drying time and also may be of such mass as to be cumbersome to handle. There are many designs of these types of ovens—some are highly insulated so that a minimum amount of heat is dissipated into the room in proportion to the amount of heat in the oven and others are designed to give maximum circulation of heated atmosphere within the furnace as compared with those in which the circulation is simply that influenced by the temperature. Each of these types have their good points and obviously the first cost of one type necessarily differs from that of the others.

HENRY FURNACE & FOUNDRY CO. • MEDINA, OHIO



Again...time-tested proof of Truscon Foundry Flask durability!

• Truscon Foundry Flasks are big favorites in the busy Henry Furnace & Foundry shop . . . *they have withstood heavy-production gaff for over twenty years!*

Truscon Foundry Flasks give full-time profitable production because of their strength, rigidity, resistance to corrosion and freedom from repairs.

Truscon Foundry Flasks are designed and built to meet the particular requirements of light, medium and heavy casting work. Correct thickness of flask walls...proper placing of flanges...types of handles and pin lugs...these features assure quick, economical, long-life production in your plant.

Write for illustrated catalog giving Truscon Foundry Flask details that may increase profits.

TRUSCON STEEL BOXES AND SKID PLATFORMS

permit the *efficient storage* of material, and *efficient* movement to production lines. Extremely durable and long-lived. May we study *your* material-handling problem?

Truscon Steel Company, Pressed Steel Div., 6100 Truscon Ave., Cleveland, Ohio. Subsidiary of Republic Steel Corp.

TRUSCON FOUNDRY FLASKS

In the planning of your core room first consider the type of work the ovens are going to dry and then plan for that type of oven which will handle this work with a minimum amount of labor cost coupled with a low fuel cost for the maintenance of the desired temperature. Sometimes the first cost of the equipment is so vital that one has to compromise with the ideal in which case it is well to remember that these compromises are possible from many standpoints. Consequently, make up your mind from what standpoint you are going to arrive at the compromise and then drive for maximum efficiency so far as the purse will permit.

As to the question of core machines here also the type of work to be produced decides what type of machines will most effectively produce these cores. The modern mass production foundry today depends for its mass production on some type of a machine. Development of mechanical production of cores and molds has reached such a high degree of efficiency that no foundry can afford to be without some mechanical apparatus with which to produce cores and molds at a minimum labor cost.

Therefore, study the type of cores to be made and then plan for the installation of that core machine which will make these cores with a minimum cost for labor and handling. Jar ram rollover machines are regularly giving a high degree of satisfaction in the production of some cores. Machines designed to blow the sand into the core box are used today in the production of small cores, particularly in the production of valves, fittings and such small work.

There is a large choice available in these different machines and the engineer who plans a foundry will do well to investigate all these different types before arriving at his final choice of his equipment. Compressed air is expensive to develop and consequently to waste it increases the cost. Therefore, in the consideration of machines for making cores the question of compressed air consumption is an important item in the consideration of the efficiency. Repair cost of such machines is also an important element.

Select Machine Carefully

The first cost of some second-hand equipment may seem to be a very economical purchase and mean material saving in the initial expense but repairs and maintenance thereafter may be such as to more than compensate for any such initial saving. Where cars are to be used for carrying the cores in and out of the ovens frequently the temperature is high enough to preclude any proper lubrication of the axles and the engineer will do well to choose that type of car that will give a minimum amount of trouble due to resistance to the movement of the car. This resistance is set up by poor lubrication or poor design of the journals or in some instances to the fact that the car is working under conditions for which it was not designed.

In other words, in planning the core equipment the type of work for which it is to be used had not been properly considered. It frequently happens that the car type of ovens are used when in reality the car type of oven was not the best for the purpose. A unit which could be moved in and out of the oven on a jack truck or carried on an over-head trolley system would have given far more satisfaction, both as to economical operation and ease of movement.

It should be emphasized here that ease of movement is not only a saving in labor but frequently results in a material saving in cores since it is not an uncommon experience to have cores broken or distorted in shape thereby making them useless because of the trouble in moving the core carrying equipment. Therefore, a batch of cores de-

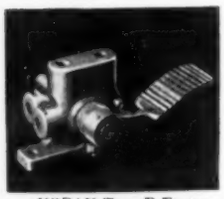
RUSH... STEAM UNION

"CAN SHIP AT ONCE YOUR ORDER NOPAK VALVES AS PER STANDARD SPECIFICATIONS"

...RUSH!

NOPAK Jolt-Squeeze Valve for Molding Machines

NOPAK Shut-off Valve Quick or Throttling Action



NOPAK Type R Foot Operated 3- and 4-Way Control Valve

NOPAK Air or Hydraulic Cylinders, Self-Regulating or Adjustable Cushion, 6 Standard Mountings

There's Nothing Unusual About This Telegram

Rush orders for standard NOPAK VALVES can generally be shipped from stock.

A special service for exceptional times? No — just regular NOPAK service stepped up to meet today's urgent needs. A large inventory of finished valves and standardized interchangeable parts makes this possible.

If your requirements call for shut-off valves, or 3- and 4-way operating valves, in hand or foot models, for pipe sizes from ¼" to 2" and pressures up to 500 lbs., — chances are that they can be shipped at once. To eliminate doubt, ask your NOPAK representative or wire Galland-Henning, Milwaukee, for a delivery date.

NOPAK Valves save you money, too, because they are leakproof and wearproof — actually improve with use, require no maintenance. If you are not familiar with the famous NOPAK Rotating Disc Principle, write for literature at once.

Two Weeks' Delivery On "Standard" Cylinders

Because specifications for NOPAK Air or Hydraulic Cylinders vary with every order it is impossible to carry finished cylinders in stock. However, it is usually possible to ship *standard brass tubing cylinders*, in ordinary sizes, within two weeks from date of order.

GALLAND-HENNING MFG. CO.
2750 S. THIRTY-FIRST STREET • MILWAUKEE, WISCONSIN

Representatives in Principal Cities

NOPAK VALVES and CYLINDERS
DESIGNED for AIR or HYDRAULIC SERVICE

A 3570-½

stroyed in this way simply because the core carrying equipment started suddenly or stopped suddenly is a very serious waste of labor and expense that should be anticipated in planning the core carrying equipment.

In planning the core room it is also important to plan some method of economical distribution of the cores from the core room to the molders' floors. Core trays that are capable of being handled in multiples without any danger or harm to the cores have proved to be an excellent step in the right direction. The transfer of cores to the molders on over-head trolleys also is proving satisfactory in some foundries where relatively heavy cores must be distributed.

If cores are to be delivered to the molders in the form of a complete assembly it is particularly desirable that these assemblies arrive in units on trays that are designed to accommodate these assemblies without any danger or harm to the assembly and the cores therein. Where cores are to be so assembled in the core room the necessary department must be provided where such assemblies may be made and properly set to jigs that will insure the accuracy of assembly.

Treated With Core Wash

Many cores are treated with a wash of some sort, for example, graphite or silica or some of the clay washes. In small foundries these washes are simply applied with brushes or the cores are dipped into a small bath of the desired wash. However, where cores are being made on a mass production basis it is not an economical process to paint this wash by hand. Furthermore, such washes standing around in small containers settle out of the water in which they are suspended and consequently the wash varies in the amount of dilution.

A good practice is to maintain the core wash in constant agitation after it has once been compounded in conformity with the desired formula by passing a jet of compressed air through pipes to the bottom of a tank in which the wash is contained. Such tanks should be located where dipping of the cores or washing of the cores may be made under the most economical conditions. For example, if the cores should be washed while hot such a tank should be located where the cores shortly after they have been removed from the hot oven may be dipped in the wash.

Most foundrymen prefer to have the fins removed from the cores before they are dipped and therefore the planning of the core room should provide for a movement of the cores from the oven to the group who remove the fins and from them they should progress to the dipping tanks and then to the drying ovens for drying the wash after its application. From there the cores should move to the assembly benches where they are assembled into the units for transmission to the molding floors.

It will be seen from this that a well planned core room needs the best kind of study and understanding of the product to be produced before any construction of the unit should be attempted and after such study each piece of equipment should be carefully considered from all angles. The location of each piece of equipment should be planned to give maximum value from its service and use a minimum amount of labor in its operation. In choosing equipment it is well to remember that probably the best of the types of equipment available in this country are offered to the foundryman through the advertising pages of this magazine. Careful consideration of available types of equipment would pay large dividends in economical production in the foundry thereafter. Demands of the war program require the most efficient operation of those making castings for the army and navy.

HAYNES JOLT SQUEEZER

Economical
LESS WEAR
LESS UPKEEP

Fully Equipped

This machine has a 10" squeeze cylinder, 3" jolt cylinder, 17 x 20 jolt table.

• The post and squeeze cylinder on the HAYNES JOLT SQUEEZER is cast all in one piece. There are no bolts or screws in this machine. The top of the post is machined on top with a 2-7/16" cold rolled shaft which the swing arm swings on.

This is a portable machine with three wheels, two in front one in back, zerk fittings on all moving parts. Comes equipped with vibrator, riddle rack, set-off board, air gauge, pop-off gauge and a pin on top of the arm for a gate horn.

HAYNES FOUNDRY EQUIPMENT CO.
1734 LAKE STREET KALAMAZOO, MICH.

IMPROVING CUPOLA PERFORMANCE

(*Continued from page* 69)

pounds or so for a starter and gradually using 2000, 4000, 6000 pounds, etc. Bronze turnings are salvaged in a cupola and there is no reason why iron turnings could not be except that it might be a wee bit more difficult. There have been several references in the *Foundry Trade Journal* indicating that British foundrymen are melting borings. One development of our war effort will be to push salvage operations in cupola melting far beyond the scope that most of us think possible today.

The cupola air supply is one of those intangibles that is confusing to many people. A cubic foot of air at 60 degrees Fahr. and 14.7 pounds per square inch pressure weighs about 0.75 pounds or about 13 cubic feet weight one pound. As it takes about 1 pound of air for each pound of iron melted, we would use about 100 pounds of air or 1300 cubic feet of air per minute for each 100 pounds of metal melted per minute. That establishes a measurable relationship between the cupola melting rate and the air supply. How many of you have known that an air weighing device showing an air delivery of 275 pounds of air per minute was also telling you that you were melting about 275 pounds of iron per minute? Those figures are relatively correct but they are subject to some modification by the actual fuel ratio, air losses, etc.

Frequently, the weakness of a cupola melting unit is in the blower. A suitable cupola blower should have the ability to deliver the weight or volume of air required at whatever resistance the cupola offers to air flow and it should have some reserve capacity for use when occasion demands. The positive displacement blower is the simplest blower to apply in a cupola circuit for the volume delivery of the blower is proportional to the speed and speed changes either up or down are relatively simple to achieve. The pressure characteristics of the cupola are satisfied largely if the blower motor is able to carry the load, and if not, the problem is one of getting a motor that is big enough.

Impellers Direct Connected

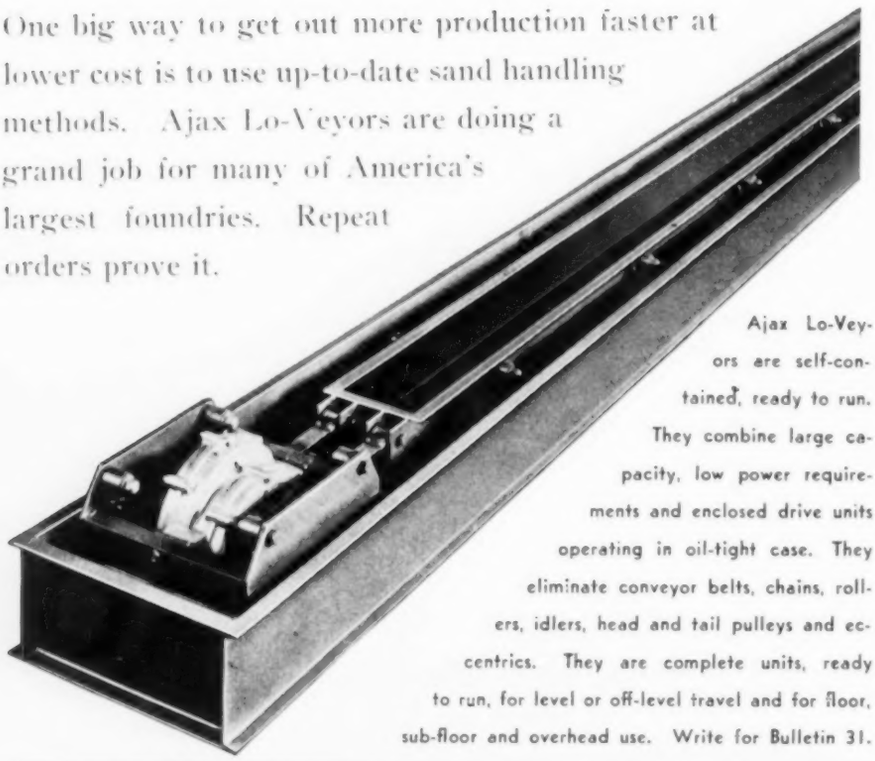
Centrifugal or fan type blowers when properly selected form entirely satisfactory types of cupola blowers. Generally, centrifugal blowers have the impellers direct connected to the rotor of a 3600 revolutions per minute motor and are based on the motor revolutions per minute at full load speed. A voltage drop in this line sufficient to slow down the motor speed would, of course, have a direct bearing on the performance of the fan.

Most blowers of this type should be designed and applied for pressures of 20 ounces or more, preferably 24 ounces or more. As the pressure loss between the blower and the cupola wind box is at least 2 or 3 ounces, those blowers would not show 20 or 24 ounces of pressure on the wind box. Blowers of this type installed at a large automotive plant deliver air against a 48-ounce resistance.

One of the tools the author uses around a cupola is a tachometer to check the speed of fan equipment. Frequently the plant electrican is asked to check the volts and amperes at the fan motor to indicate a possible voltage drop and determine if the motor is overloaded. The cupola blower should have a source of fresh air. If the blower is installed in a special room, this room should not be sealed up. If there is an intake pipe on the blower, this pipe should not be covered with a screen of less than 1-inch mesh.

AJAX LO-VEYORS
Convey

One big way to get out more production faster at lower cost is to use up-to-date sand handling methods. Ajax Lo-Veyors are doing a grand job for many of America's largest foundries. Repeat orders prove it.



Ajax Lo-Veyors are self-contained, ready to run. They combine large capacity, low power requirements and enclosed drive units operating in oil-tight case. They eliminate conveyor belts, chains, rollers, idlers, head and tail pulleys and eccentrics. They are complete units, ready to run, for level or off-level travel and for floor, sub-floor and overhead use. Write for Bulletin 31.

AJAX FLEXIBLE COUPLING CO. WESTFIELD, N.Y.
204 ENGLISH ST.
MANUFACTURERS OF VIBRATING SCREENS, PACKERS AND FLEXIBLE COUPLINGS

Air circuit between the blower discharge opening and the melting zone of the cupola includes piping, blast gates, by-passes, air metering devices, the cupola wind box, clean out doors on the wind box, peep-hole covers on the wind box, and joints in the piping. When the wind box extends down to the cupola base plate, it includes the slag and tap hole frames and the cupola base plate. These are likely sources of air losses between the blower and the melting zone of the cupola. It is not easy to keep this air circuit absolutely free of any air loss, but in many cases it is 20 to 30 per cent or more of the total air delivered by the blower, and this loss could be halved or quartered.

Air measuring devices include pitot tubes, orifice plates and calibrating the ampere load on a motor in terms of pounds of air. A well known volume meter is a pitot tube, while one air weight controller is based on an orifice plate. Another air weight control is an ammeter. The measurements from these are reduced to pounds of air. These air weighing or measuring devices tell us, if they are in good working order and properly adjusted, the rate of air flow. They indicate the rate of air flow at this point in the air circuit is 100, 200, 300, etc., pounds of air per minute or 1300, 2600, 3900, etc. cubic feet of air per minute just as the speedometer on the automobile says the car is moving at a rate of 40, 50 or 60, etc., miles per hour.

Air Flow May Vary

It is a good thing to know what this rate of air flow is, but if there are large air losses in the air circuit this information is of less value and may be practically meaningless with a very leaky air circuit.

Just as you can get satisfactory operation from an automobile over some speed range of say 25 to 75 miles per hour, so you can get some degree of satisfactory cupola operation over a range of air flow. A cupola being supplied with air at the rate of 200 pounds of air per minute can work with an air flow of 100 pounds or 300 pounds.

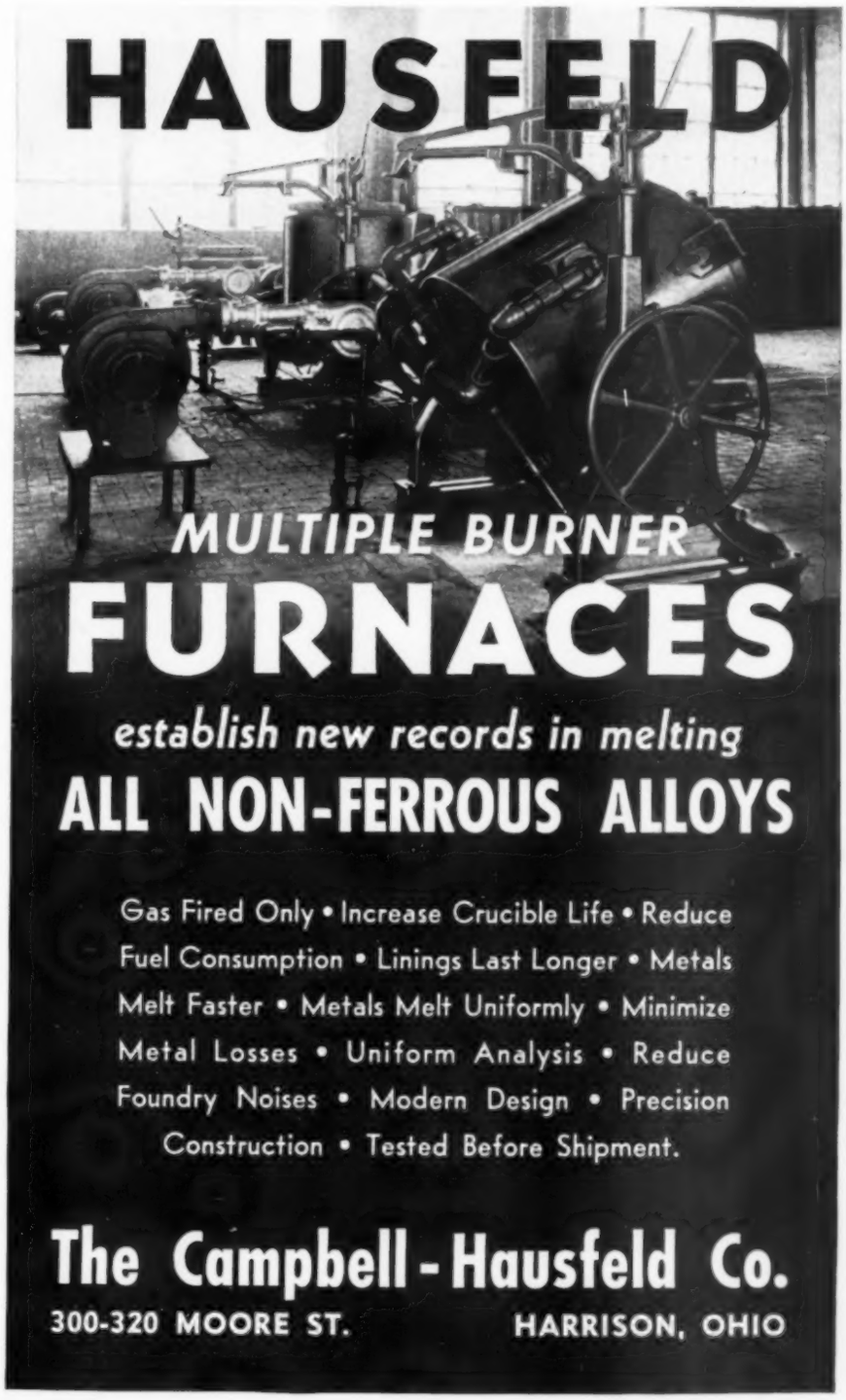
Many of us think that a cupola melting 10 tons of iron per hour with 200-pound coke charges is more or less fixed in its ability to consume fuel to a rate of 10 charges of 200 pounds each or 2000 pounds per hour. Actually, the cupola carburetor is capable of handling fuel and air over a considerable range just as the carburetor on your automobile is able to handle a wide range of fuel and air.

Earlier it was stated that if your air weighing device was showing 100 pounds of air flowing to the cupola, it was really telling you that the cupola was melting about 100 pounds of iron per minute. Now if you want less iron or more iron per minute, the primary function of an air weighing device is to enable you to establish whatever melting rate you need from the cupola.

Air weighing or air metering devices are really speedometers on the air circuit. A cupola works better when this speedometer is 25 pounds of air per minute per square foot of cupola area (325 cubic feet) or more, up to about 40 pounds (520 cubic feet). Cupolas are harder to operate when this speedometer shows 15 pounds of air per minute per square foot of cupola area (195 cubic feet of air). If it is necessary to operate at varying speeds during a day, it is best to slow down from high speed than to speed up from low speed.

Cupolas have been charged with mechanical devices for the past 40 years. For many years foundrymen were doubtful that a mechanical device could do as good a job as hand charging. A first-class mechanical device can do just as good a job as hand charging.

Assuming that the only type of mechanical charging device which would be installed in your foundry is one that would maintain or im-


HAUSFELD
MULTIPLE BURNER
FURNACES
establish new records in melting
ALL NON-FERROUS ALLOYS
Gas Fired Only • Increase Crucible Life • Reduce Fuel Consumption • Linings Last Longer • Metals Melt Faster • Metals Melt Uniformly • Minimize Metal Losses • Uniform Analysis • Reduce Foundry Noises • Modern Design • Precision Construction • Tested Before Shipment.
The Campbell-Hausfeld Co.
300-320 MOORE ST. HARRISON, OHIO

prove your present cupola performance, we could say that whether you should or should not consider mechanical charging is a simple matter of arithmetic. If you know what you spend for charging labor per ton, how much you melt per day and per year and what a mechanical system would cost to install and to operate after installation, you can find the correct answer without much difficulty. If you melt 10,000 tons per year at a cost of $1.50 per ton for charging, and if you could install a mechanical charger for $10,000 and then charge for $0.35 per ton, you would charge mechanically. If you melt only 1000 tons per year at only $1.00 per ton for charging, it would be difficult to install mechanical charging without increasing your operating expense.

There are incidental features which need be considered to evaluate the problem clearly. For instance, in building a new foundry, part of the expense of building a heavy superstructure for a charging floor could be eliminated and credited to the expense of a mechanical charger which does not require a charging floor. The mechanical charger might be arranged to provide for unloading incoming pig iron, scrap, etc., and might make better use of the yard storage space available. Installation of mechanical charging might include relocating the cupola charging door to a higher elevation so that it would have a better opportunity to use less coke. Or a mechanical charger might take an appreciable load off the foundry supervision that could be directed to other efforts. The author has seen all these factors prevail and feels that a thorough study of the problem of mechanical charging would not ignore them.

A cupola charge that contains pig iron, scrap, coke and limestone is one thing and a cupola charge that contains two or three different kinds of pig iron, outside scrap as well as your own scrap, steel scrap, spiegel- or ferromanganese, ferrosilicon or silicon briquets, etc., including coke and limestone is still another thing. That is, an iron charge containing the two components of pig and scrap is relatively simple, while the iron charge containing six, eight or ten components is much more complex.

Preheating the cupola air supply or possibly a method of salvaging some of the wasted heat of the cupola by using it to preheat the cupola air supply has intrigued foundrymen for a great many years. Though the idea of preheating is almost as old as the hills, the practical application has had to await suitable materials and is paralleling to some extent the development of heat resisting metals.

Hot Air Has Advantages

Hot air is less chilling to slag and metal than cold air and is an aid to longer operating periods. The reaction between fuel and hot air is more thorough than with cold air so that the metalloid losses of silicon and manganese are less. This is an important feature with a melting process that usually oxidizes 10 per cent or more of silicon and 20 per cent or more of manganese. Incidental to this lift on furnace atmosphere control is the ability of a hot blast operation to use lower quality materials in the charge. Because reactions between fuel and air are speeded up with hot air, the cupola melting rate is higher.

Preheating equipment has been more successful here than anywhere outside this country. Three systems have endured the test of time, one is the system used by American Cast Iron Pipe Co., in which a cast iron U-tube forms part of the cupola lining just above the melting zone. Air is blown through this U-tube en route to the wind box. Another is that developed by the Griffin Wheel Co. This system exhausts the cupola gases between the melting zone and charging door,

TIMES HAVE CHANGED. 'Control of the Air' is as essential in a war time economy as it is in the militaristic sense. It can no longer be ignored in any plant, regardless of size.

Dust spells inefficiency and waste—and these conditions cannot be condoned today when every shackle that keeps production in check *must* be loosed.

When the time comes "to do something" about the dust condition in your plant be sure to investigate "Dustubes"—they have the high efficiency necessary to do your job better; and they are by far the simplest cloth type collector to install, operate, and maintain. Write for literature today.

AMERICAN
FOUNDRY EQUIPMENT CO.
505 S. BYRKIT ST. MISHAWAKA, IND.

supplies fresh air to burn carbon monoxide to carbon dioxide in a combustion chamber and the hot gases pass through a cast iron heat exchanger where heat is transferred to air en route to the cupola.

The third system in use is an independently fired preheater, in which any fuel may be burned. It was developed by the late Dr. Fahrenwald, Fahralloy Co. It consists of a series of heat resisting steel tubes, having an inside diameter of 1.6 inches, involving concurrent and countercurrent flow. The units are designed to handle 100 cubic feet of air so 6000 cubic feet would require 60 units in parallel. Preheated air in the cupola has merit, but this merit is limited largely to the very large tonnage foundries.

In addition to weighing and preheating the cupola air supply, equipment is also in use for conditioning the air. Air conditioning generally means drying the air, but in a greater sense, it means keeping the moisture constant. It can be done in several ways, such as drying with a chemical, including lithium chloride, silica gel, or activated charcoal, etc., or it can be done by cooling the air by refrigeration and condensing the water. Conditioning the cupola air supply is reasonable and logical and it can be done at nominal expense.

Control Moisture Content

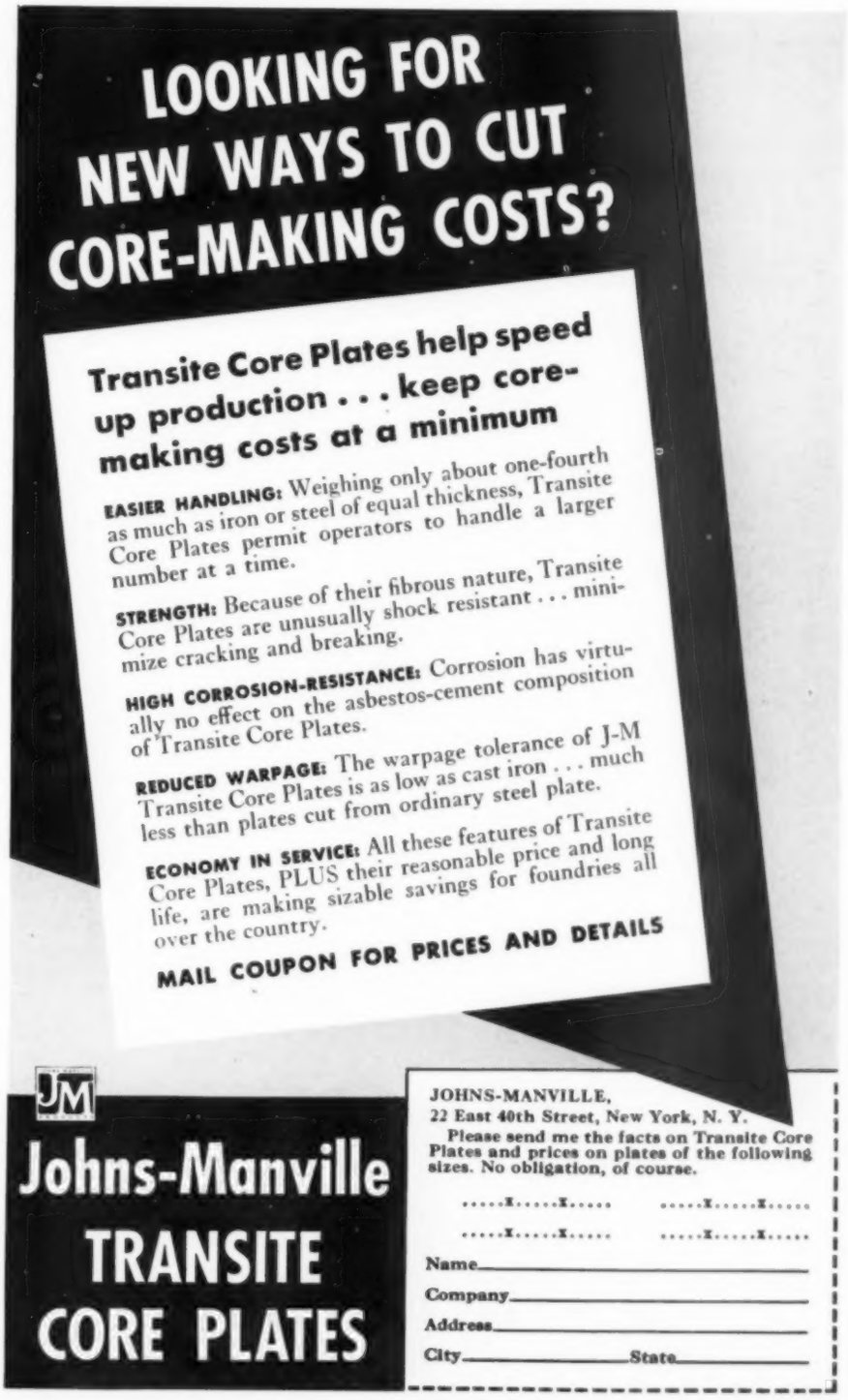
On the basis that it takes 2000 pounds of air per ton of iron melted the weight of water in this air will be as little as 7 pounds on a cold dry day to more than 40 pounds on a hot humid day. If this variable in melting practice could be eliminated at nominal expense it would be a good thing.

Some foundries have attempted to offset the harmful effects of increased moisture on a hot humid day by using more fuel, others have modified their charge to use less steel and more pig iron. A large automotive foundry varied the coke charge between 450 and 500 pounds per 4000-pound iron charge from a dry to a humid day. This was a compensation of up to 25 pounds of coke per ton of iron melted and as the foundry has melted as much as 2300 tons of iron in a day, it amounted to a lot of fuel on a humid day, almost 29 tons.

Effects of increasing moisture in the air supply is an increasing tendency to have hard spots in castings, minute pin holes in heavy sections, colder metal temperatures and higher melting losses. The first chemical drying air conditioning system installed on a cupola about 10 years ago cost $15,000 for 3000 cubic feet of air per minute or about $5 per cubic foot of air. This expenditure was much too high, but equipment is now available for less than 1/3 this cost per cubic foot. Air conditioning equipment removes one more variable from cupola practice.

It is a smart foundryman who weighs the metal as it is tapped from the cupola or as it is poured into the distributing ladle from a reservoir ladle. To know about how much metal you need for a mold or a floor is one thing, but to know exactly how much metal you need and to have a means of weighing it very precisely is, in the author's opinion, a much finer thing and a shop technique which is a big step forward in foundry management. If you need 1500 pounds of metal to pour that mold or that floor, it expedites the metal handling system if you put 1500 pounds in the ladle and not 2200 pounds and hold up the ladle while you try to figure out where you can put what's left after pouring the mold.

Yes, that procedure doesn't leave any provision to take care of run outs, but run outs are due to poor flasks, poor molding, etc., and it might be a good idea to correct these troubles at their source. If you add ladle additions of any sort, it's good to know you have 1500 pounds of metal in that ladle and not find


LOOKING FOR NEW WAYS TO CUT CORE-MAKING COSTS?
Transite Core Plates help speed up production . . . keep core-making costs at a minimum
EASIER HANDLING: Weighing only about one-fourth as much as iron or steel of equal thickness, Transite Core Plates permit operators to handle a larger number at a time.
STRENGTH: Because of their fibrous nature, Transite Core Plates are unusually shock resistant . . . minimize cracking and breaking.
HIGH CORROSION-RESISTANCE: Corrosion has virtually no effect on the asbestos-cement composition of Transite Core Plates.
REDUCED WARPAGE: The warpage tolerance of J-M Transite Core Plates is as low as cast iron . . . much less than plates cut from ordinary steel plate.
ECONOMY IN SERVICE: All these features of Transite Core Plates, PLUS their reasonable price and long life, are making sizable savings for foundries all over the country.
MAIL COUPON FOR PRICES AND DETAILS
JM
Johns-Manville
TRANSITE
CORE PLATES
JOHNS-MANVILLE,
22 East 40th Street, New York, N. Y.
Please send me the facts on Transite Core Plates and prices on plates of the following sizes. No obligation, of course.
Name
Company
Address
City
State

out later that you had 1700 or 1800. It isn't a widespread practice to weigh molten metal, but the author has seen it in several foundries, and it always impressed him as a job well done.

The automotive foundries install two wires in a cylinder block mold at a point in the mold determined by trial. Metal poured into the mold connects the electrical circuit to ring a bell or blow a siren. When the siren blows the pourer turns the ladle back immediately. This saves a lot of metal per mold that was formerly used but not essential.

Furnace operation should not terminate at the point where metal leaves the cupola spout for the quality of a casting removed from a mold is dependent on chemistry, on a satisfactory melting practice, on a satisfactory metal distributing system, on a satisfactory mold and on a satisfactory temperature and pouring speed for transfer of metal from the ladle to the mold.

Deficient as they may be, cupola operations are likely to be at a higher level of skill than the metal distributing system. There are many instances where we could apply all the tricks of the trade toward improving cupola operations and achieve our goal without materially changing the overall performance of the foundry.

A good metal distributing system aims to expedite distribution of metal as it becomes available in the least possible time and with the least possible confusion. Such a system should get metal to the mold with the least possible loss of temperature, and should get it there in the exact quantity necessary. Those in charge of such a system should strive to empty ladles completely before they are refilled, should strive to pour all of the metal melted into molds and not any of it into pig molds, should avoid reladling of metal as much as possible, should investigate preheating ladles versus using cold ladles, should consider covered ladles and heavier refractory lining in ladles, etc.

If you have been impressed with the operating factors discussed, then let me direct your attention to the metal distributing system in your foundry, advising you that it has its share in the economy and efficiency of your foundry, and adding that from observations, it is frequently possible to make more gains here than in furnace operation.

This is the concluding article of two on cupola practice taken from lectures presented by the author before the Central New York Chapter at Syracuse and Elmira, N. Y. The first appeared in the January issue.

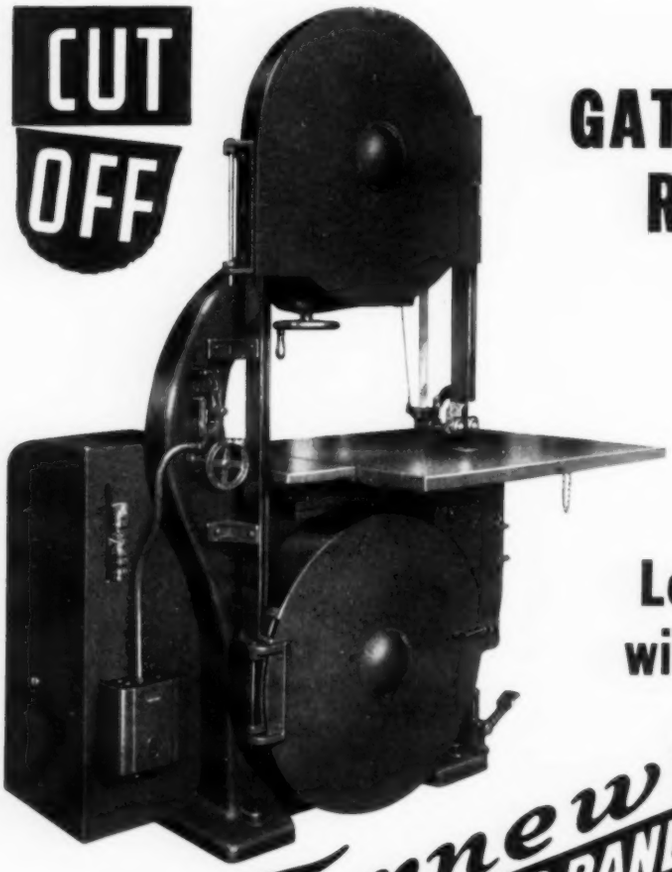
THE EDITORS.

Book Review

Textbook of the Materials of Engineering, by Herbert F. Moore, 454 pages, published by the McGraw Hill Book Co. Inc., New York, for $4.

This is the sixth edition of a textbook of engineering materials which for years has been recognized as an authority in the field. In this edition, a chapter on plastics has been added. In addition, it is pointed out by the author that most of the chapters have been revised and later test data provided. Rather extensive changes have been made in chapters on failure of materials by flow or creep, on the failure of materials by fracture, on the crystalline structure of metals, in tables of strength and ductility properties of ferrous and nonferrous metals, and in the chapter on testing, inspection and testing machines.

The author is research professor of engineering materials, engineering experiment station, University of Illinois, a past president of the American Society for Testing Materials, and for years an active participant in the committee and specification work and other activities of that organization.



CUT OFF

GATES and RISERS in any metal in far Less Time with

Tannewitz METAL CUTTING BAND SAWS

Variable Speed Models to fit Every Need

In addition to our regular High Speed Band Saws delivering over 2 miles of smooth vibrationless saw travel per minute, which have proved so exceedingly popular in automotive and aviation work, the TANNEWITZ line now offers five other models to provide the fastest cutting medium for every foundry need: a 30" machine to provide any speed from 300 to 900 blade feet per minute—a similar machine with 3-step V-belt drive to give 2300, 3100, 4000 blade feet per minute—a 36" machine with 32" capacity under the guide—a model with 48" wheels and one with 52" wheels, operating at 3,000 blade feet per minute for handling extra large castings. Get a line on the TANNEWITZ metal cutting band saw that fits your particular needs. It will save time, step up production and repay its cost dozens of times. Write for full particulars NOW!

THE TANNEWITZ WORKS, GRAND RAPIDS, MICHIGAN

FOUNDRIES GIRD FOR WAR DEMANDS

(*Continued from page* 67)

commercially valuable but who did not lay a foundation for wide experience in the production of a wide variety nonferrous castings.

Foundries Are Hampered in Improving Properties Of Castings

By H. A. SCHWARTZ
Manager of Research
National Malleable & Steel Castings Co., Cleveland

MONOTONOUS and repetitious as it may seem, no one can currently write about metallurgical matters without mentioning the needs of the national defense. Attempts to allocate for the most urgently needed purposes substantially all of the alloying elements procurable in the United States has deprived the foundryman of most of the important means by which improvement of properties was achieved during the past few years. Until iron itself becomes the bottleneck, the steel foundryman seems to be left without recourse except to develop further than in the past the properties obtainable from plain carbon steels.

Happily, the recent work on the fixation of nitrides and on the effect of very small amounts of rather rare elements gives some hope of improving the response of the lower carbon cast steels to heat treatment. It seems reasonably likely that in the rather near future he will have available as alloying elements only moderate amounts of manganese and reasonable amounts of silicon and molybdenum. The malleable foundryman may have to do without copper, his most useful alloying element.

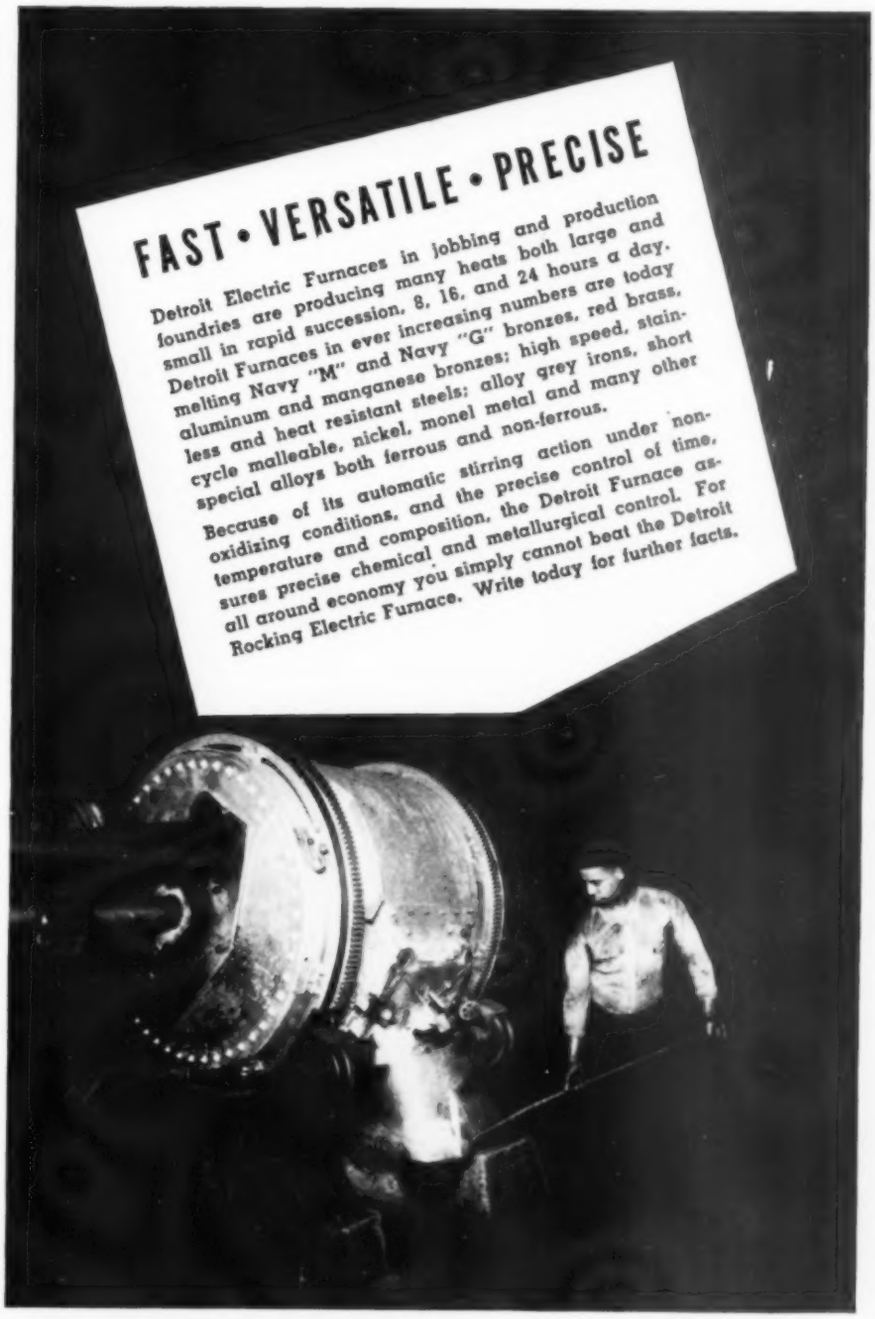
Specification Unification And Co-ordination Are Pressing Needs

By JOHN W. BOLTON
Director, Metallurgical Testing and Research
Lunkenheimer Co., Cincinnati

TECHNOLOGICAL advances in the castings field have been very rapid within the past year. Many of these have added materially to fundamental knowledge of the metallurgy of the materials involved. This is important in that understanding of the basic principles enables alterations and substitutions to be made with maximum assurance of success.

In the cast iron field, certain alloying agents are scarce. In many cases in the past, liberal usage of alloys has been an easy way out and there is no question but that a considerable percentage would not bear analysis or close scrutiny from the viewpoint of engineering economy. Closer study and closer control of carbon and silicon is a proper course to follow. Knowledge and skill can help economize in materials, and close technical control pays real dividends. More and able technologists are needed in this field. Older empirical methods, successful in their day and place, often cannot be maintained. Without knowledge and understanding of metallurgical principles, shifts made necessary in today's program cannot be made safely and surely.

In this connection the restrictions on pig iron compositions are not helpful to the foundryman. It is understood that to promote blast furnace production, making of the higher silicon pig irons is largely prohibited. A real problem in the iron foundry is to produce castings of maximum machinability consistent with a prescribed strength


FAST • VERSATILE • PRECISE
Detroit Electric Furnaces in jobbing and production foundries are producing many heats both large and small in rapid succession, 8, 16, and 24 hours a day. Detroit Furnaces in ever increasing numbers are today melting Navy "M" and Navy "G" bronzes, red brass, aluminum and manganese bronzes; high speed, stainless and heat resistant steels; alloy grey irons, short cycle malleable, nickel, monel metal and many other special alloys both ferrous and non-ferrous.
Because of its automatic stirring action under non-oxidizing conditions, and the precise control of time, temperature and composition, the Detroit Furnace assures precise chemical and metallurgical control. For all around economy you simply cannot beat the Detroit Rocking Electric Furnace. Write today for further facts.
DETROIT ELECTRIC FURNACE DIVISION
KUHLMAN ELECTRIC COMPANY • BAY CITY MICHIGAN

range. In general this end is best attained with the lower carbon, higher silicon types.

Authorities seeking to stimulate the production of pig iron—largely for steel usage—may be defeating some of the ends they seek, namely saving on man hours in industry. This is especially true in connection with machine tool hours and the conservation of alloys and special graphitizing agents (electric furnace type usually) in the gray iron field. Industry is highly integrated and what may seem effective in one respect may prove quite detrimental to some other branch. The plea of an editorial in the November 1941 issue of THE FOUNDRY for better representation of the castings industry in the higher circles is warranted.

Among a number of forward trends in steel castings is the greater usage of welding methods. More downright factual research and less opinions (usually restrictive) are needed. Increased knowledge of the effects of temperature on metals (largely through the encouragement of the A. S. T. M.-A. S. M. E. Joint Research Committee) is being attained, and should find distinctive applications in the development and usage of these materials for defense purposes.

The copper base and nickel base alloy fields are in a state of flux. Availability of component metals, including copper, nickel, tin, zinc and others is a question. A number of substitutions will likely be required. Unfortunately researches stressing the engineering properties of many nonferrous alloys are conspicuous by their scarcity. A considerable percentage of these alloys is used where operating temperature is a factor, and but few laboratories have done any real work on the problems involved. Substitutions which maintain the acceptance test values for such alloys may (in the absence of data) lead to disaster in applications.

Important as the above trends and conditions may be, they are overshadowed in this emergency by the cumbersome restrictions in a number of the federal procurement specifications, and specifications also emanating from other sources. First, the quality and uniformity of cast materials must be maintained to high standards. Second, specifications should be streamlined and the red tape cut out.

Co-ordination, correlation and unification of specifications should be effected and effected promptly. The A. S. T. M. is working vigorously in this direction, in both ferrous and nonferrous committees. Co-operation has been given by federal agencies, by the A. F. A., the M. S. S. and various other groups. In the writer's opinion the surface has just been scratched. Far more intensive action and greater speed is needed. Pet provisions and opinions unsubstantiated by either practical observations or sound research should be thrown overboard. Iconoclasm should prevail. This country can drift along and lose much, and so can the industrial groups therein. The present emergency is a challenge to groups like the A. F. A. which represent the technical aspects of the castings industry.

GET FULL UNIFORM MELTS

Regardless of unfavorable conditions

This typical "R-C" Blower installation is a "repeat" order for one of the leading manufacturers of fine machine tools.

Here's an important advantage of Roots-Connersville Cupola Blowers. The required volume of air is delivered constantly—unaffected by variable resistance within your cupola. This characteristic aids in securing full, uniform melts—and with less power consumption than by any other type of blower. *Positive Displacement* design is the reason.

Roots-Connersville Blower performance is helping speed production in many of the largest foundries in the country. It's the kind of performance you need NOW—more than ever before! Write for Bulletin 22-B12 today.

ALL OUT for VICTORY

Roots Connersville SINCE 1854 Positive Displacement CUPOLA BLOWERS

ROOTS-CONNERSVILLE BLOWER CORP.
202 Madison Ave., Connersville, Ind.

Use Available Materials Much More Efficiently Than in Past

By R. G. McELWEE

Manager, Foundry Division
Vanadium Corp. of America, Detroit

RAPID changes which have occurred in the raw materials situation have made it necessary for most operators to find new combinations of materials to make up their charge. Many of them have not known, until forced to make these changes, how versatile their actual requirements can be; furthermore the situation has forced many to

use certain commodities much more efficiently than in the past. The tendency in gray iron seems to be toward alloy additions so timed as to be most efficient.

Special Materials Offer Wider Use of Castings In Defense

By J. H. SMITH
General Manager
Saginaw Malleable Iron Division
General Motors Corp., Saginaw, Mich.

AS WE enter 1942, we find the foundry industry in an excellent position to offer considerable aid to the national defense program, as well as in the commercial nondefense field.

Many foundries have developed a special product in which the properties have been materially increased, thereby permitting a wider use of the material.

Our own development of Arma-Steel is an example, the use of which is broadening each month. Each application serves to open a new channel for other uses.

One of the more recent applications is in the automotive piston field, wherein the material offers a combination of high strength, a desirable weight and good wearing qualities.

This material has also found its way into the defense program and by its use has released certain critical materials for those industries that can use no alternative materials.

We feel that the future promises to be most interesting in the ever constant job of keeping the foundry industry in its rightful place among the other great industries of our nation.

Designers and Foundrymen Co-operate and Make Better Progress

By MARSHALL POST
Vice President
Birdsboro Steel Foundry & Machine Co.,
Birdsboro, Pa.

WITH the help of radiographic technique, continued progress has been made in the manufacture of castings of complicated shape and large size—for example, many of those used in ship construction. As a result of intensive efforts in many quarters, the average quality of such castings now being made is much higher than was thought possible even a few years ago. Co-operation between designer and foundryman in the production of these difficult jobs, leading to the elimination of some of the more undesirable features of design, has made some progress and it is hoped and expected that more will be accomplished along these lines as engineers become more familiar with the peculiar problems of the steel foundryman.

In this connection it is interesting to note that orders are being received to an increasing extent by steel foundries for parts formerly ordered as forgings. This tendency indicates clearly the progress that has been made in improving the soundness, strength, and reliability of cast products and in familiarizing engineers with the results that have already been attained, so that they are more willing to accept castings for places where formerly they had supposed forgings to be the only reliable material to use.

The alarming scarcity of steel scrap has resulted in an increased melt of pig iron by open hearth foundries, as the proportion of pig iron to scrap in the charge has had to be considerably increased. It is not possible to go too far in the direction without slowing up furnace practice to a prohibitive degree and the scrap problem has been one of the major headaches of the industry.

All Out War Against Axis Aided By Robins Shake-outs

Important Plants Put In Many Units

Two Models For Continuous Or Pick-up Operation

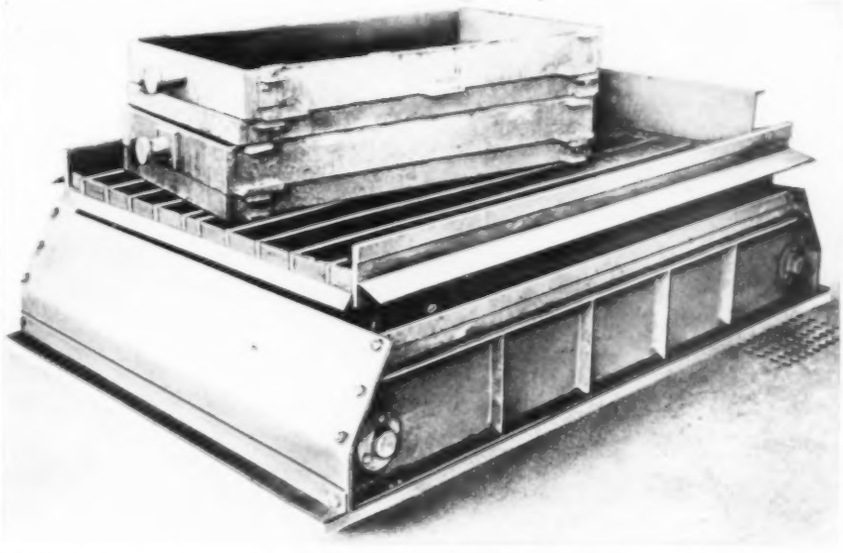
A wide range of sizes of Robins Shake-outs, both standard and special, have been successfully installed in various war plants. The main reason given for the selection of these units was the insurance against lost time provided by the many safety features built into each Shake-out.

New "Full-Floating" Feature Eliminates Overloading Danger

Heavy Coil Springs Carry All Loads

(*Special to Robins*)

PASSAIC, N. J., 1942—Latest developments in Robins Shake-outs indicate maximum safety for both operator and machine, according to users. These Shake-outs are completely accessible with no protruding shafts, bearings, drive equipment or structural frames extending beyond the Shake-out surface. The vibrated frame, entirely supported on coil springs, is therefore extremely smooth-running and definitely protects the bearings from accidental overloads. This cushioning action also greatly reduces the possibility of flask breakage.



ROBINS designs and constructs Apron Conveyors, Bucket Elevators, and many other products for foundries, including screens for cleaning sand and removing gaggers or parts of gates, risers, or cores; also Belt Conveyors with or without special Idlers such as the patented RUBBERDISC Return Idler or the famous Robins Belt Trainer. Write direct to Robins for specific information.

ROBINS CONVEYING BELT COMPANY, Passaic, N. J.

Meeting War Requirements Will Aid in Solving Future Problems

By P. J. POTTER
Executive Vice President
The Pangborn Corp., Hagerstown, Md.

DURING 1941 manufacturers of foundry equipment have been kept busy designing and making special machinery for the mass production of all the new and complicated machines of war. It is right and proper that we should do so, gladly, cheerfully and willingly.

In so doing we are apparently neglecting the normal development of more efficient machines for the production of the every day necessities of life. In this emergency period it is inevitable that our activities are directed toward "guns instead of butter" and none of us would suggest a change in activities.

But all thinking men should be acutely cognizant of the accumulating shortage of new designs of equipment for regular peacetime production and each should make his own plans for intensive resumption of work on improved designs as soon as the emergency passes.

The solutions we achieve after grappling with war time requirements will not be entirely wasted, for out of the meeting of these new problems will come new abilities within us which will better enable us to meet the problems of peace. Not the least of these new abilities is the habit, rapidly being formed, of solving problems in a fraction of the time formerly considered normal.

Simplicity
FOUNDRY EQUIPMENT
A Vital Link
In Defense Production

Listed below are some of the important jobs being done by Simplicity Shake-Outs and Sand Units in the Foundry Industry today.

★ ★ *Shaking out flasks and knocking out the castings in tank production. Castings consist of hulls, turrets, treads, and other miscellaneous cast parts. Loads up to 100 tons must be handled.*

★ ★ *Shaking out flasks and knocking out castings in fifteen aluminum and magnesium foundries.*

★ ★ *Shaking out various sizes of flasks carrying cast bombs of all sizes up to 1000 lb. bombs.*

★ ★ *Shaking out flasks, knocking out castings, and screening sand in 105 steel foundries.*

★ ★ *Screening and conditioning sand in 26 foundries operated by or for the Aviation Industry.*

SIMPLICITY ENGINEERING CO.
DURAND, MICHIGAN
For Canada: Waterous Limited, Brantford, Ontario

Realization of Need Will Provide Mass Production Procedures

By F. A. MELMOTH
Vice President
Detroit Steel Casting Co. Detroit

NINETEEN hundred forty one in the steel castings industry, has been one of production, and still greater production. Manufacture of specialized types of work for war purposes has absorbed the energies of the industry almost to the limit of its present capacity.

Probably the most remarkable factor in this situation is the realization of just how important a part steel castings are to play in an adequate war program, and from this will develop, undoubtedly, great mass production schemes for vital steel castings for armament purposes.

The severe working conditions imposed upon castings for many defense purposes have resulted in a wide application of nondestructive testing methods, such as magnaflux, X-ray and gamma ray.

A striking growth in interest in the converter method of steel production has developed, and there can be no doubt that many such furnaces will be installed in the near future for purposes for which they are entirely suited.

Specifications for castings have received careful attention from competent bodies in the industry with a view to the removal of anomalies, and there can be no two opinions on the necessity of a complete overhaul of such specifications with a view to clarification and simplification in order to assist production with no detrimental effect upon quality.

Stringency in certain materials is already evident, aluminum for deoxidizing and certain types of ferroalloys being outstanding examples.

Supplies of steel scrap of adequate type and composition are far from easy to obtain, and in circumstances of increasing pressure for both better quality and improved delivery the effect of unsatisfactory steel scrap supplies cannot be minimized.

Heat Treated Cast Irons And Steels Conserve Strategic Metals

By F. O. HAMLET
Factory Metallurgist
S K F Industries Inc., Philadelphia

IN THIS day of great need for alloy steel additions such as nickel, chromium, and tungsten in order to obtain the best combinations of physical properties in those steels used for armament, it is becoming increasingly necessary to review the design and application of specific parts with the purpose of substitution in mind. Herein the metallurgist can accomplish a great forward step in the war effort by combining the principles of photo-elastic study with a knowledge of steels and their heat treatment in order to conserve these needed alloys for more exacting applications.

Much has been accomplished by the substitution of heat treatable cast irons and steels with a likelihood of many more such substitutions in future, but at the same time it appears that a comprehensive study of heat treating methods including quench media, flushes, jigs and the like would make possible the production of machine parts of quality at least equal to those produced by less exact treating methods and requiring greater alloy additions for achievement of desired physical properties. Here could be accomplished a definite and positive advance in the conservation of strategic metals which would lead to greater output of armament needs.

Wholehearted Co-operation In Approving Alternates Is Gratifying

By C. J. ZAISER
President
Ampco Metal Inc., Milwaukee

WITHIN recent weeks, American industry has been confronted with a blunt and unpleasant fact that the available supplies of some alloys and the capacity of some manufacturing equipment are not sufficient to meet actual war needs unless these supplies and this capacity are completely closed to all nondefense use. And that procedure is not feasible.

The general feeling was one of surprise, for the general assumption had been that these would be minor (and not too inconvenient) shortages. Let it be said that the wholehearted co-operation of the war and navy departments and the aircraft industry in approving substitutions has been greeted with surprised gratification. Direct governmental divisions in particular have had the reputation of insisting on exact adherence to specifications, sometimes to their own apparent detriment, and American industry is pleased to note the trend toward the using of specifications as a guide rather than a mandate.

In the bronze alloys field, a few outstanding examples of this co-operation as regards substitutions have included: Substitution of large centrifugally cast rings for forgings in view of the cost of forging dies and the shortage of hammer equipment; and the substitution of centrifugally cast bar stock in 15-inch lengths for extruded material in mill lengths to avoid a 90-day delivery delay. (This substitution, incidentally, involved waiver of the customary bend test.) The substitution in several instances of an alloy different in chemical and physical properties from the material originally specified.

Naturally these variations from established procedure involved careful consideration of the requirements of the installation and the proposed substitute. The fact that the necessary exceptions were permitted, however, is a tribute to the co-operation of those responsible.

Always..
100%
UNIFORM

DRUM
CARLOAD
TANK-CAR

"Ask the men who use them"

•

We Also Manufacture
DOCO BINDER AND CORE PASTE
DOCO STEEL CORE AND MOLD WASH

THE DAYTON OIL CO.
Factory and General Offices
DAYTON, OHIO

Industry Shows Ingenuity In Using Substitute Raw Materials

By H. W. JOHNSON
Superintendent
North Western Foundry Co., Chicago

IN THE manufacture of gray iron castings during the present emergency, there has been a good deal of discussion on the problem of substitutions in raw materials, because of shortages. When it is all boiled down, it is found that though there have been changes in the type of alloys used to give identical physical properties, the most significant change that has taken place is the way foundrymen have utilized available raw materials which were heretofore considered inferior for the production of quality castings. More accurate control in melting with the aid of devices for measuring air supply has done much to bring this about. The wider use of briquetted borings has been the result of difficulty in obtaining the right kind of scrap. Needless to says briquets provide a very desirable substitute.

Difficulty in securing castings previously made in aluminum and the long delays in delivery of certain types of malleable and steel castings has prompted a number of customers to have these made in cast iron of a suitable analysis. The result has been that cast iron has performed very satisfactorily, especially the high test irons, and far more applications for this material will be found in the future.

Meehanite castings have played an important part in the defense program and unquestionably will continue to make greater advances in the field of superior quality castings.

Standardized Ingot Specifications

How Many Specifications Do You Require?

Consider the infinite variety of nonferrous parts required as America turns out everything from automobiles to battleships.

Then consider this: Identified with the growth of U. S. industry since 1880, Ajax has produced ingot and alloys to specifications covering, in the aggregate, virtually the entire range of nonferrous casting application or usefulness today.

Thus your requirements are met invariably with knowledge, with a solid grasp of procedures which begin *after* we deliver—as well as before. This applies to all your specifications—including NFIMI, ASTM, SAE, Federal, Naval, and the others.

The result is ingot metal and practical technical follow-through in which, *as always with Ajax*, you have implicit confidence.

15 STANDARD ALLOYS BY AJAX

Ajax Tombasil
Ajax Plastic Bronze
Ajax Anti-Acid Bronze
Ajax Phosphor Bronze
Ajax Red Brass Ingots
Ajax Manganese Bronze
Ajax High-Tensile Manganese Bronze
Ajax Golden Glow Yellow Brass
Ajax Nickel-Copper 50-50%
Ajax Manganese Copper
Ajax Aluminum Alloys
Ajax Phosphor Copper
Ajax Silicon Copper
Ajax Nickel Alloys
Ajax Phosphor Tin

NOTE

The first program for scientific control of ingot metal production was set up in and by the Ajax Metal Company 44 years ago.

Investigate These Alloys

THE AJAX METAL COMPANY
ESTABLISHED 1880 PHILADELPHIA

ASSOCIATE COMPANIES: AJAX ELECTRIC FURNACE CORPORATION, *Ajax-Wyatt Induction Furnaces for Melting*
AJAX ELECTROTHERMIC CORPORATION, *Ajax-Northrup Induction Furnaces for Melting, Heating*
AJAX ELECTRIC COMPANY, INC., *Electric Salt Bath Furnaces*

Urgent Defense Demands Create New Methods And Materials

By FREDERIC O. HESS
President
Selas Co., Philadelphia

URGENT defense demands not only require new conceptions of large scale quantity production, but they also create new methods and new materials—required adequately to fulfill military and production demands, but useful far more widely. Among the many striking advances which have been made during the present intense activity is undoubtedly the development and production of cast armor plate, a metallurgical advance which will influence future material selections, applications and treatments to an extent which is difficult to visualize.

This particular development involves two major factors: A new alloy and a series of sequential heat treatments on new and exceptionally exacting cycles. Proof is offered on a large scale, and in an undisputable manner, that uniformity and accuracy of heat treatment can produce exceptional metallurgical results—and at the same time permit design simplification, assembly elimination, and other means of reducing production costs and complications. To illustrate the significance of this technological and heat treating development more clearly, we cite the production of one-piece cast hulls and turrets for the heaviest of army tanks.

The absolute necessity of uniform heating and exacting cycles may be appreciated when it is considered that (a) single hulls weigh several tons and are as long as 20 feet and vary widely in mass at different points; (b) normally insignificant temperature variations would in this process produce nonuniform and unacceptable armor; and (c) every casting is its own test piece. Already several large production furnaces are in operation daily producing cast-armor hulls, etc.

POROSITY IN ALUMINUM CASTINGS

(*Continued from page* 65)

on the surface with a thin coat of flux. Heat the metal to 1250 degrees Fahr. or if titanium is added, to 1350 degrees Fahr. Next, flux the metal by adding a handful of flux and skim with an iron rod which has been coated with lime wash. Skim off the oxide and impurities evenly, then cover the surface with a film of flux. Allow the metal to freeze in the pot until a pipe occurs, or to about 1150 degrees Fahr., after which reheat to desired temperature and skim off flux. The metal then should be poured as quickly as possible.

A quick test can be made immediately after pouring the first mold by taking a wooden wedge, or a sharp edged stick, and pushing aside the oxide cover or film on the surface of the riser. If there is porosity in the metal, small bubbles or pin holes will appear.

The second type of porosity results from improper gating. This form can be recognized by holes both large and small in various parts of the same casting. These holes depicted in Fig. 6 are chiefly the result of disturbance in the sprue, runner, gate or casting cavity. Proper gating will do away with this disturbance. Several factors enter into proper gating, and include 1. Size of sprue, gates or runner. 2. Proper placement of choke in sprue, gates, or runner. 3. Number, location and size of gates.

Use Choke in Gate

It is a good rule to keep the cross section area of the sprue slightly smaller than the total cross section area of the gates, and in turn to keep the total cross section area of the gates slightly smaller than the cross section area of the runner. This rule works well in practice when the pattern maker puts a set gate on the patterns, but most foundries do not have the facilities to do this and so resort to temporary gates, or, as in the case of short running jobs, cut the gates in the mold.

If the casting requires only one runner and one gate, the choke should be placed in the runner. Putting a choke in the runner controls the volume flow of the metal to the casting. To avoid spurting and to insure a smooth flow, the choke should be placed neither too near the sprue nor too near the gate. If a number of gates are used, the choke should be placed in the gate and not in the runner channel.

In deciding the number, location, and size of gates, several things should be considered: 1. Size and shape of casting. 2. Characteristics of metal. 3. Pouring temperature. In general, if a casting is large the gates should be large, the idea being to fill the mold as quickly as possible.

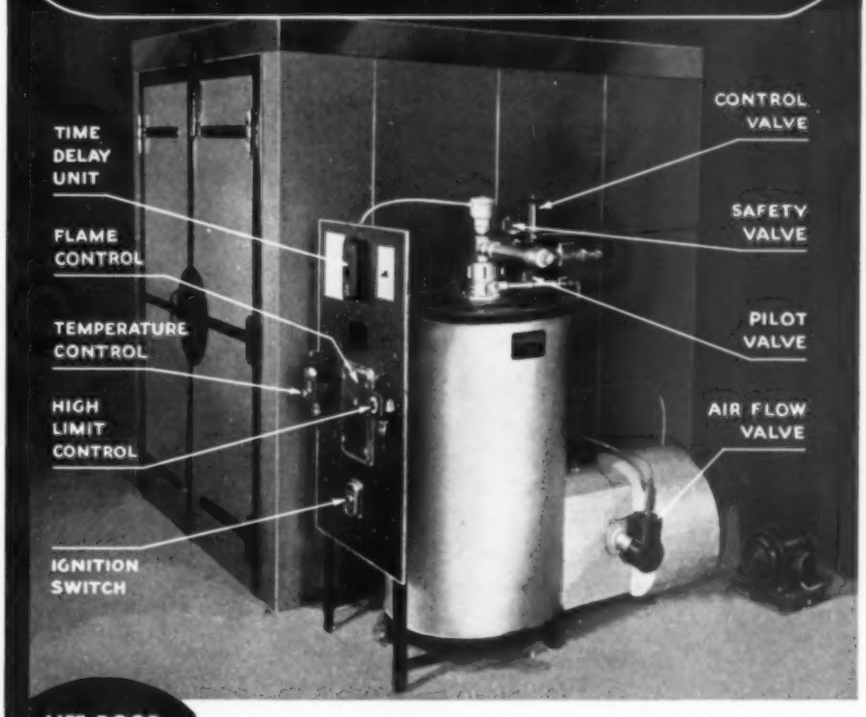
The thickness of the walls also should influence the size of the gates. For example, if a casting has ⅛-inch walls it would be foolish to use a 1-inch square gate as it is obvious that only a ⅛-inch stream of metal can flow through the ⅛-inch walls. With a casting having a large surface area and thin walls, a number of gates all around the casting have to be used as shown in Fig. 1.

Flow of the metal should be directed according to the shape of the casting. Having the gate enter the casting in a direction parallel to the walls avoids any hitting, and provision of a generous fillet avoids any drop. Whenever possible, the gate should enter at the bottom of the casting in order to allow the metal to flow upward.

It is a good policy to have the runner and the gate so placed that

LANLY CORE OVENS

earn "top" rating for SCIENTIFIC DESIGN and EFFICIENT OPERATION



LIFT DOOR OVENS • MOULD OVENS • CAR OVENS • PORTABLE RACK OVENS • CONVEYOR OVENS

The above typical Lanly heating unit is equipped with every known device to assure *economy of fuel*, accurate control of all functions, and safety under all conditions.

Visualize a similar unit installed on top of the oven, at the rear, on either side, or even in a shed outside the building if space is limited and you will understand why Lanly can furnish an efficient oven of any type or size.

Write for complete information.

THE LANLY CO.
750 PROSPECT AVE. • CLEVELAND, OHIO

RADIANT Since 1879 FACINGS

MANUFACTURED IN OUR OWN PLANT...
DISTRIBUTED FROM OUR WAREHOUSE

BILL GAGGER SAYS:

"It does make a difference when you use RADIANT FACINGS"

For 63 years
RADIANT FACINGS
have been making
BETTER CASTINGS

•

WE MANUFACTURE

Core Compounds
Core Washes • Blackings
Plumbago • Seacoals
Parting Compounds
Tripoli—Low Silica—Liquid
Core Pastes and Binders
Shake Bag Facings
Anti-piping Compounds
"Ferrograph" Graphitizer
Special Facings & Compounds

WE WAREHOUSE

Purite • Goulac • Glutrin
Bentonite • Silica Flour
Soapstones and Tales

LEADERS FOR 63 YEARS..
The Smith Facing & Supply Co.
1857 Carter Rd., Cleveland, Ohio

once the casting is poured the runner feeds the gate. This will prevent the gate drawing from the casting.

It is characteristic of some metals to dross easily while pouring. These require the use of strainer cores, horn gates, and oxide traps. In most aluminum alloys, it is only necessary to use a simple runner in the cope, with the gates in the drag connecting the runner with the casting.

Pouring temperature varies with the size and number of gates. An allowance should be made above the necessary temperature in order to allow the metal to rise freely in the casting, up through the risers, and still remain fluid. One casting, for example, when poured at 1260 degrees Fahr. leaked badly under pressure. When the temperature was changed to 1300 degrees Fahr. it withstood pressure.

The third type of porosity, indicated by small holes on the cope side of the casting, is that caused by trapped air and gas in the mold. When the metal enters the mold cavity, it displaces the air in the mold making it necessary to have the proper vents, whistlers, or other means to allow the air to escape from the mold.

Gas is formed as soon as the metal fills the mold cavity. This gas can escape only through the sand, and therefore the sand must be permeable. Permeability is affected by moisture, clay content, fineness, and mold hardness. Some foundries use a fine facing sand and back it up with an open sand. This procedure proves helpful.

Vents Are Important

Proper vents are essential. Very often a casting with incorrect vents will misrun at 1450 degrees Fahr., with proper vents it is possible to run the casting at 1350 degrees Fahr. Inside cores should be vented, and these vents continued on through to the outside of the mold as indicated in Fig. 7. Cores which form the cope side of the casting should not have a high skin hardness or the resulting reaction will form pin holes on the surface of the casting.

The fourth and last type of porosity is caused by shrinkage. This is, perhaps, the most misunderstood form, for although it is more or less a surface condition it can go very deep without causing the well known shrink to occur. Shrinkage is found in castings when there is: 1. A variation in wall thickness. 2. Insufficient feed to heavy sections. 3. Lack of pressure.

When the wall sections of a casting vary, the thinnest wall freezes first and then draws from the next thinnest. This is taken care of commonly by a fillet which only reduces the shrinkage in proportion of the fillet to the variation in the wall thickness but does not eliminate it. This shrinkage causes microporosity exemplified in Figs. 2, 3 and 4. However, if the proper feed or chill is used on the wall from which the metal is being drawn, the condition and resulting shrinkage can be avoided entirely.

Feeding the heavier sections of castings and chilling any which cannot be fed is the usual method of preventing shrinkage porosity. In addition, care should be taken to use risers sufficiently large to allow the metal in them to remain liquid until after the heavier sections have solidified. It is also important to locate any chills on the heavier section only. These should not lap over to the uniform sections or the effect will be counterbalanced.

Lack of pressure is another reason for shrinkage porosity. Pouring a mold without a cope or without any hydrostatic pressure above the casting will tend to surface creep or walk and cause a surface porosity. The importance of eliminating porosity from castings is only too evident. Porous-free castings have a higher tensile strength, greater elongation, higher yield point, and of course, a better appearance.

If when porosity appears it is possible to classify it as resulting from the metal itself, improper gating, trapped air and gas, or from shrinkage, it is then only a matter of studying the various elements in that class and by learning the cause of the porosity to build up the definite knowledge necessary to eliminate porosity from future castings.

Book Review

New Encyclopedia of Machine Shop Practice, 561 pages, edited by George W. Barnwell, professor of production practice, Stevens Institute of Technology, Brooklyn, N. Y., and published by Wm. H. Wise & Co. Inc., New York, for $1.98.

Compiled from the works of a number of authors, this book covers not only the fundamentals of machine shop practice in an elemental way, but also fabricating methods including foundry work; forging; welding, soldering and brazing; pressing, stamping and punching; and heat treatment of metals.

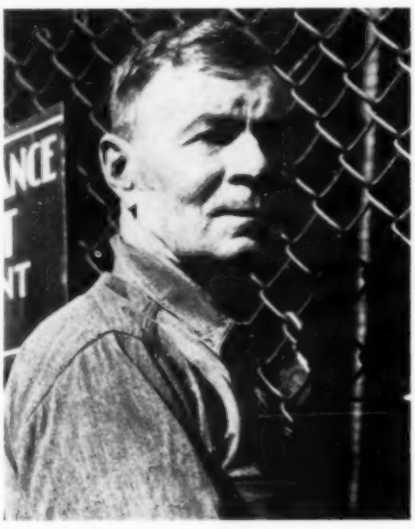
Portions of this book dealing with the properties of cast metals and foundry work are inaccurate in numerous instances. The author of the section dealing with "Metals in Engineering Production" evidently is not completely familiar with the important developments

in all types of castings in recent years. For example, he points out that "the worker should always treat an iron casting with respect" since "it is in general a moderately hard metal sufficiently brittle to be broken readily by a hammer blow." Also "between the ordinary run of foundry irons for general purpose castings and the alloy cast irons . . . there comes a class of irons generally alluded to as high strength irons, which for all practical purposes could be regarded as iron produced from the best ores and under strict metallurgical control." In several instances, the chapter "Foundry Work" indicates the author is perhaps more familiar with European practice than with American operations.

He Worked 50 Years In the Foundry

Frank Hady recently completed his fiftieth year of service with the Belle City Malleable Iron Co., Racine, Wis. He was not sick a day in his life or away from work because of illness. Company doctors say Frank is still A-1 physically. After Frank worked 46 years as a molder, company officials realized he was not the type to ask for lighter work because of advancing years. He was given the job of watchman, which, in these days of defense production, is mighty important.

Frank started with Belle City



Frank Hady

when he was 18, coming to Racine from his birthplace, Watertown, Wis.

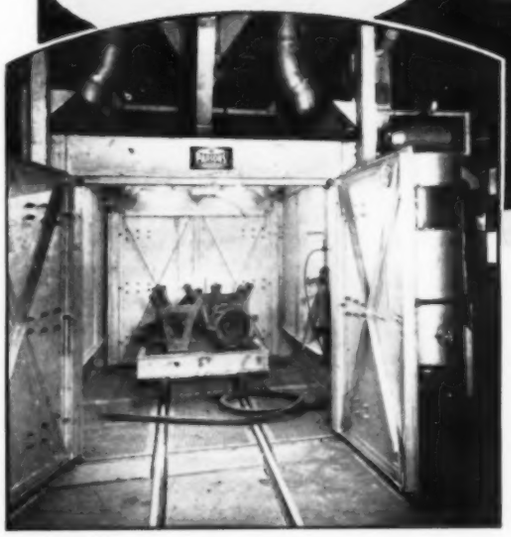
When asked whether he would advise a young man to learn the foundry trade he said: "Certainly. It's not as tough as it may appear. Just stick with it for a while and you'll never want any other kind of work. It sort'a gets in your blood." His words must have some value for his son, Erving, age 30, is also employed at Belle City and is on his way to beat his Dad's record.

Frank was signally honored by Belle City by the presentation of a gold watch when he passed his 40th year of service. When the 45th year rolled by, he was given a diamond studded pin. He is also president of the company's "25 year club" of veteran employes.

Job Evaluation

American Foundrymen's Association, 222 West Adams street, Chicago, has published No. 11 of its management series which deals with time study measurements and job solutions. The publication includes a paper by Phil Carroll Jr., New York, on "Practical Time Study Measurements for Foundry Operations" and one "Job Evaluation and Employe Rating" by A. L. Kress, New York. Available for 50 cents to members and $1 to nonmembers.

FASTER WAR PRODUCTION with PARSONS Blast Rooms



because of

BETTER VISION

The Parsons lighting arrangement eliminates eye strain—speeds production—by making work clearly visible from every angle.

BETTER VENTILATION

The Parsons Downdraft Ventilation carries dust DOWN and away from the operator, leaving him free to do a better and faster cleaning job.

UNUSUALLY EFFICIENT ABRASIVE CLEANER

The Parsons Abrasive Cleaner does a perfect job of removing refuse and spent abrasive. Clean abrasive of proper size is returned to the gun, insuring the fastest and most effective cleaning job.

Write for Bulletin R-41

GRIT *Blast* . . SHOT *Blast* . . SAND *Blast*

• • •

Other PARSONS Victory Aids:

BLAST CABINETS — DUST ARRESTORS

• • •

WE ARE DISTRIBUTORS OF INDUSTRIAL METAL ABRASIVES. Prompt delivery from stock of both shot and grit. Write for SAMPLES.

• • •

Built by

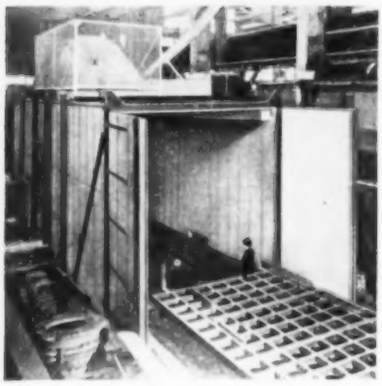
PARSONS ENGINEERING CORP.

CLEVELAND, OHIO

THE NAME PLATE THAT MEANS QUALITY

PARSONS

How to Increase—Improve Core Production—Yet Save



HEAT • SPACE OVEN COST

In dozens of foundries Gehnrich Type "IC" Ovens are daily producing more cores and molds than designed for, with absolute assurance of uniform baking—no case hardening. Yet the oven space required for this extra output is actually less than that required by other ovens.

The reason is simple: Type "IC" Ovens integrate the external heating system (any fuel) with the efficient construction of the Gehnrich patented insulated Dual Panel Oven into a complete, compact unit that eliminates expensive external ducts and heat loss. It supplies uniformly distributed, recirculated air with plenty of air changes, adequate ventilation and interlocking safety controls to make the operation as nearly perfect as has ever been possible.

Write for this Catalog No. 108

Dozens of these ovens are doing a swell defense job. Let us tell you where and how.

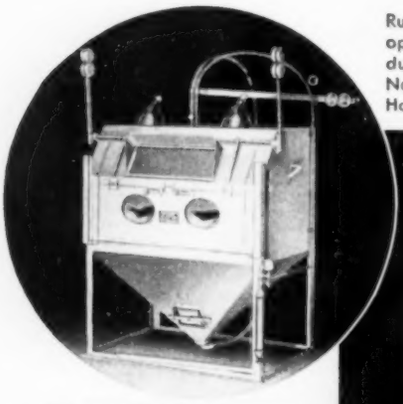
THE GEHNRICH CORPORATION
42-11 35th St. Long Island City, N. Y.

GEHNRICH CORE & MOLD OVENS

SAND BLASTING *Made Easy*

for Defense Production!

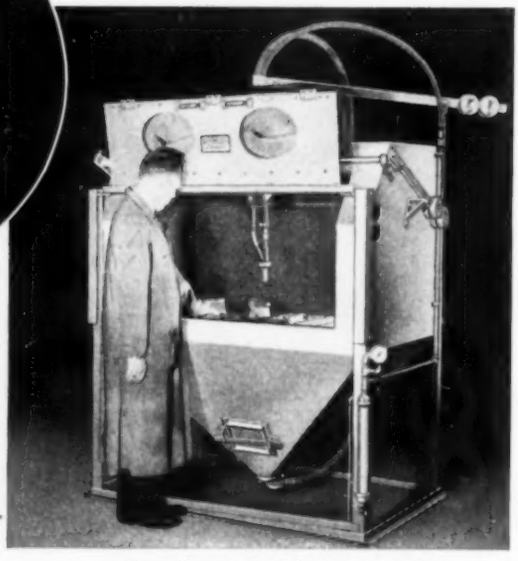
Ruemelin Sand Blast Cabinets put blast cleaning operations on a faster, more efficient basis. Eliminate dust, permitting installation anywhere in the plant. No skilled labor required. Sturdily constructed. Handles sand or steel abrasives. Prompt delivery.



RECOMMENDED FOR:

1. Heat treating plant—removing scale, oxides.
2. Aircraft production—cleaning welds, metal preparation.
3. Foundries, ferrous and nonferrous — cleaning castings.

RUEMELIN MANUFACTURING CO.
3850 N. Palmer St • Milwaukee, Wis.



Ruemelin cabinet with door open. Provides quick access for loading and unloading.

RUEMELIN Blast Cleaning Cabinets

A 3635-½

CASTING GUNS CENTRIFUGALLY

(Continued from page 63)

mold through the pouring box by tipping the furnace. The poured charges range from 450 to 5000 pounds each, according to the size of the gun being cast. Both molds and pouring boxes are preheated prior to pouring.

As soon as the casting has cooled sufficiently, the end cover of the casting machine and mold is unbolted and the hot gun is pushed out by a hydraulic ram. A crane removes it to the cinder floor where it is buried in cinders until cold. One of several oil-fired, car-bottom type furnaces then receives it and it is normalized. After remaining at normalizing temperature the proper length of time, it is withdrawn and air-cooled (quenched).

In an adjoining building are a large number of vertical cylindrical oil-fired furnaces for heat treating. The gun now is lowered into one of these and heated to temperature and is then given a differential quench by dipping it several times, large end first, into water. This is necessary as the gun is much larger at the breech than at the muzzle and this treatment insures uniformity in physical characteristics throughout. Finally, the gun is drawn ready for machining.

In casting, the weight of the metal plus the centrifugal force of rotation throws all the slag and inclusions to the center. Only a small center hole is left so that all the dirty steel is eliminated when the gun is bored.

Use Special Machines

Great strides also have been made at Watertown in boring and machining the guns cast there. In fact, a single machine has been designed to bore the center and machine the exterior surface simultaneously. Of course a lot of old equipment is still in use, but even this has been modernized. For instance turning lathes for finishing the outside of guns have been equipped with six tool posts so that six cuts are taken at once, thereby reducing the machining time to almost one sixth.

There are also boring lathes with twin headstocks and twin tailstocks so that two guns can be bored simultaneously. A hydraulic straightening press is employed to straighten any tubes that are out of line. All the cast-iron molds are bored and machined in this department. Another great saving in this type of gun is the cutting of the rifling directly into the bore instead of in-

serting a separate liner as formerly.

Steel mills long have taken advantage of the fact that extensive cold and hot working make steels stronger and tougher. Pressing between two surfaces such as rolls and forging dies was easy, but with a thick-walled steel tube the amount of this working strictly was limited. Watertown solved the problem by placing the gun tube within a huge, cast-steel container and pressing it from the inside by hydraulic pressure. This innovation was started just prior to the World war. By applying a high pressure, the diameter of the bore of the gun is materially increased and the elastic limit of the steel is almost doubled.

At the same time, another fundamental change takes place in the gun wall, thus solving another problem. This cold working puts the layers of metal near the bore under compression by the contracting force of the outer layers, just as the shrunk-on jackets and hoops formerly did. This cold working allows an increase of very nearly 100 per cent in powder charge and projectile weight without increasing the wall thickness, to the traveling speed of mobile artillery today while at the same time preserving maximum fire power.

Design New Gun Carriage

The bombing airplane and its antidote, the antiaircraft gun, made necessary an entirely new type of gun carriage to permit high-angle elevation. New and practical designs were developed successfully at Watertown and put into mass production. Full advantage was taken of the welding process in designing carriages and mounts to simplify their manufacture and decrease their weight. This was accomplished by substituting built-up welded structures in place of heavy cast-steel parts.

It might almost be said that the greatest epoch in gun-making history was that period immediately following the World war and that all this progress was made by the Ordnance Department of the U. S. Army at the Watertown Arsenal. However, this progress would have been impossible without the aid of the arsenal's research department. Ferrous research for the entire Ordnance Department is centered at this laboratory which has long pioneered in the development of ferrous metals and metallurgical methods. Its influence on commercial industry in general and war materiel in particular has been profound.

Here was built the first machine for testing the strength of metals. Findings made with this and similar machines led to the change-over from cast iron to steel in the manufacture of guns. Here, all incoming raw material and material in

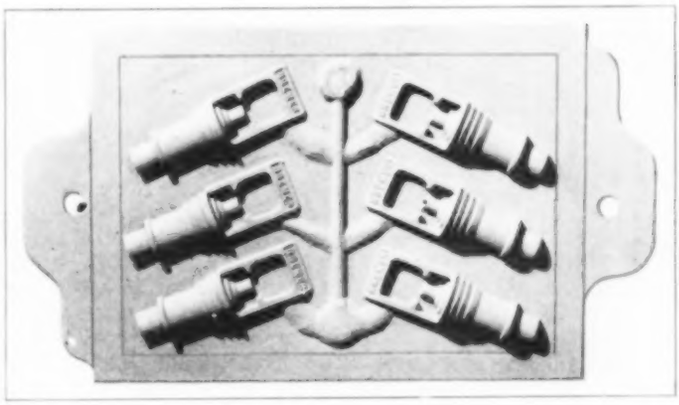
ON TO VICTORY

with faster production methods

USE . . . TAMASTONE

The Perfect Pattern Compound

Foundries everywhere are changing America's *Defense* Drive into a *Victory* Campaign with more efficient production methods. TAMASTONE saves hours by converting loose and metal gated patterns into one or more match plates. Micrometer accuracy on separate cope and drag patterns too! What's your problem? Write today!



RESULTS

At left is a complete Super TAMASTONE match plate made from 6 loose patterns. Production doubled! — Loose pattern costs cut 50-75%.

TAMMS SILICA CO., 228 N. LaSalle St., Chicago, Ill.

PULMOSAN RESPIRATORS

D 4100

For Lung Protection

The D-4100 respirator will protect your men against inhalation of pneumoconiosis-producing, or nuisance dusts. Comfortable and light-in-weight, it features double protection in two filters, easy breathing, and the patented Pulmosan non-inflated rubber cushion.

There is a Pulmosan respirator for every breathing hazard! Let them protect YOU against LOSS OF SKILLED WORKMEN, COMPENSATION, LOSS OF TIME, and PROFITS. Send today for your free copy of the Pulmosan catalog for your files—a quick reference for every safety device in industrial protection. Address department M.F.

"Everything For Industrial Safety"

PULMOSAN SAFETY EQUIPMENT CORP.

176 JOHNSON STREET BROOKLYN, NEW YORK

■

FOUNDRY MODERNIZATION

We have convincing evidence to prove to you that if we are called in to conduct an independent and unbiased survey of your facilities, present and future requirements, such survey will disclose ways and means to bring about worthwhile improvements necessary to increase production, cut cost and insure the greatest return on your investment.

■

PLANNING

Unless guided by past performance, no one can master the multitude of knotty problems which invariably present themselves in carrying out new improvements. We can assist you in planning, laying out, and specifying new equipment for sand conditioning systems, continuous melting, molding and pouring, core room and cleaning departments, ventilating systems, new buildings, material handling and storage, etc., etc.

■

EXECUTION

The knowledge and experience which we have gained during twenty years of uninterrupted practice as foundry engineers are invaluable to our clients in carrying out new projects, plant expansion or rehabilitation. We cover the entire field. Our services will expedite completion of your project, save you money, work and worry. Clients of national prominence will attest to our ability.

A. A. WICKLAND & CO.
FOUNDRY ENGINEERS
ENGINEERING BUILDING
CHICAGO

—Advt.

process are checked chemically, structurally, and physically. One machine here has a testing capacity of one million pounds, and the world's largest impact testing machine is also part of the equipment. Here also was developed the armor-piercing projectile.

Examination of steel parts for defects is made by photographing them with x-rays for the thinner sections, but radium is employed in photographing the large and thick pieces. While the chemical laboratory is the first and last resort for steel analysis, a fast test of gun samples is made spectrographically. A continuous electric spark between two parts of the same sample is observed through a spectroscope and the spectrum compared with that of a section of known analysis. A densitometer measures the actual density of the lines of the spectrum and this gives the actual percentages of the different alloys.

A most important research problem now engrossing the laboratory is the development of better armor plate and armor-plate steels of low alloy content; that is, steels benefited by the strategic metals. The staff is now, co-operating with fifty industrial firms in developing cast and rolled armor plate for aircraft, helmet, and body armor. Also a technique for the welding of armor is being developed. This includes a conciliation of the metallurgical and ballistic characteristics to determine those properties essential to armor plate. As a result, several firms have already qualified and are making both cast and rolled armor plate.

Hygiene Foundation Holds Meeting

Practical measures for health protection of workers, first requisite for maximum production, were outlined for industry at the sixth annual meeting of Industrial Hygiene Foundation which was held at Mellon Institute, Pittsburgh, Nov. 12 and 13. Approximately 400 industrial executives and employe health specialists attended, a gain of 170 over last year. Theme of the meeting was "Defend the Defense Worker."

Delegates heard results of foundation-supported researches, including effects of arc welding fumes on tuberculosis and best x-ray techniques for mass physical examinations. Authorities urged the employers to conduct industrial hygiene surveys and to keep records of sick absenteeism — fundamental steps in the conservation of industrial manpower, especially now when increasing production tends to increase health hazards.

■

DELIVERY problems MAY sometimes be SOLVED merely by CHECKING your NEEDS (for foundry supplies) with NEW sources of SUPPLY. May we HAVE the opportunity TO DEMONSTRATE how WE "DELIVER the GOODS?" Just write, WIRE, or phone us.

ST. LOUIS — 2 ARMIN PL. REPUBLIC 5097
EDWARDSVILLE — PHONE 134
MOLINE — TOM HAMLIN, JR. — Y. M. C. A

MIDWEST
FOUNDRY SUPPLY COMPANY
EDWARDSVILLE, ILL.

Quality---Service

TRAINING LABORATORY APPRENTICES

(*Continued from page* 60)

samples preference over regular production, at least to the extent of keeping the metallographist and his assistant supplied with the necessary specimens and sections for macro and micro-examinations, etc. is observed.

Later after he learns the theory and principle of tensile testing, impact testing, brinell, scleroscope and rockwell hardness testing, etc. his duties are broadened to include a daily check of these instruments as well as the actual performance of operations and the accurate recording of data, drawing of curves, charts, etc.

If the apprentice is selected to begin training in the metallography and gamma ray divisions of the laboratory he is taught the use of the camera, and assigned to miscellaneous photographic work at once. After a few lessons in the matter of focusing, shutter speeds, lighting, etc., he is permitted to develop negatives and make prints, mix solutions and otherwise familiarize himself with the general principles of photography and gamma-ray work. Later he is given the job of polishing specimens, etching and preparing them for microscopic examination, sulphur-printing, etc.

Apprentice To Study

As stated previously, each apprentice is expected to devote at least 4 hours per week to study and reading. This for the most part is done on his own time, although reading of technical reports and technical literature is permitted during the noon-hour and at such other times of the day as will not interfere with the daily routine of the apprentice and the demands on his services by others. Apprentices in the chemistry laboratory must review their elementary high school chemistry—or, if they have never studied chemistry in school, they are assigned a chapter per week and a few minutes each day or so at the close or beginning of the turn is taken by the head chemist for review and additional explanation of the main principles involved in the text.

In addition, each apprentice is given a manual consisting of three parts or sections. Section I is entitled *Instructions to Chemists and Laboratory Technicians* and will be presented later in this article. Section II outlines the laboratory organization and personnel and describes in detail the duties of each member of the staff both functional

CLEAN CASTINGS

FASTER CHEAPER

with

MARSCHKE GRINDERS

LOW FOUNDRY CLEANING COSTS depend upon smooth running abrasive wheels turning at correct speeds during all stages of wheel life—depend, in short, upon good machines. Eighteen features, including stiff spindles, controlled speeds, automatic wheel guards and grit-proofed bearing housings guarantee superb efficiency to users of Marschke Grinders. Marschkes are unequalled for dependable durability under toughest, dirtiest foundry conditions. Marschke swing frame and floor stand Grinders are *the* economical machines for all cleaning and snagging operations.

THE MARSCHKE LINE

Over 70 specifications of Swing Frame, Floor Stand and Pedestal Grinders—and Buffers—1 to 25 HP, 10" to 30" wheels. Write today for Marschke Catalog, to

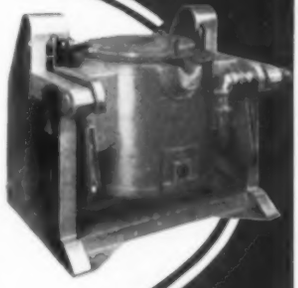
VONNEGUT MOULDER CORP., 1839 Madison Ave.
Indianapolis, Ind.

Do you know...

what Melting Room Equipment is Engineered to your Production and Facilities?

The Fisher Library

will answer this and many other Melting Room problems that have direct bearing on the production and melting economy of non-ferrous metals to meet both Defense and Commercial specifications.



from... small capacity Stationary Crucible Melting Furnaces—

to... Large Motorized units—gas or oil fired.

BULLETIN NO. 350
Stationary Crucible Melting Furnaces—gas and oil fired—Silicon Carbide Linings, Karmix Furnace Cement, Pumps, Gauges, Valves, Strainers and Tongs.

BULLETIN NO. 400
Hand Operated Tilting Crucible Furnaces—gas or oil fired.

BULLETIN NO. 57
Motorized Nose Pour Crucible Furnaces—gas or oil fired.

BULLETIN NO. 300
Aluminum Melting Furnaces, stationary and tilting types—gas or oil fired.

BULLETIN NO. 101
Iron Pot Melting Furnaces—gas fired—actual performance figures, instructions for care of pots.

BULLETIN NO. 53
Combination Blowers and Oil Pump Systems, and Centrifugal Blowers.

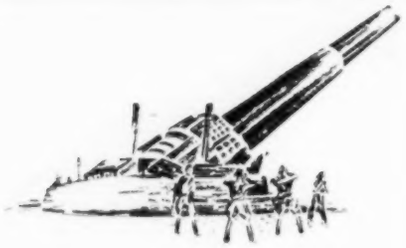
BULLETIN NO. 200
Industrial Burners, Proportional Gas or Oil Burner Assemblies, Metering Valves and Blast Gates.

Fisher ENGINEERING SERVICE

was inaugurated to assist you to meet today's exacting specifications and is at your disposal, without obligation. A service backed by 35 years of furnace designing and building experience. Consult Fisher TODAY!

1742 N. KOLMAR AVE. CHICAGO, ILL.

Fisher FURNACE COMPANY



for the

ARMY and NAVY

it must be right!

● In castings for Army and Navy ordnance and aircraft materiel, there's no room for "pretty good" or "good enough." It must be GOOD! Such castings must be the kind you like to run your hand over . . . raise your brows in approval . . . create a tingle of pride in your foundry work.

● Today you must be prepared to meet rigid specifications, with plenty to spare and the minimum of rejections.

● FOSECO Products help you to make such castings. That's why FOSECO Products are now used extensively in hundreds of foundries producing war equipment. When you're up against exacting new problems, requiring *better* surfaces, *higher* physical properties and *speedier* production call on FOSECO products to solve *your* problems. From gas and blow-hole elimination to crack prevention, there's a FOSECO Product to fit your need!

USE FOSECO PRODUCTS FOR:

● *Gun metal, tin bronzes, composition mixtures, phosphor bronze, yellow brass, conductivity copper* ● *Aluminum bronze, manganese bronze, silicon bronze* ● *Nickel silver, monel* ● *Aluminum remover* ● *Aluminum alloys (sand or die)* ● *Grey iron and malleable* ● *"Corecoat"—for core dressing.*

FREE OFFER: See for yourself what FOSECO Products will do for your castings—at our expense. Tell us what alloys you are casting and we will send you promptly a working sample that will enable you to meet rigid government specifications. Write today to:

FOUNDRY SERVICES, INC.

280 MADISON AVE. NEW YORK, N. Y.

and specific. This enables the apprentice to rapidly acquire an understanding of his job and its relation to the jobs of all the other workers in the department. The relation of the metallurgical and chemical laboratory to the other production department is covered in this section. Section III of the manual contains the official standard methods for the analysis of iron and steel, alloys, foundry supplies, gas, oil, refractory materials, coal, coke, etc.

Apprentices assigned to investigation work and physical testing are supplied with a text on the manufacture and properties of iron and steel and the physical testing and interpretation of results. The schedule of study includes the iron-carbon diagram and principles of metallography, etc.

The apprentice assigned to the metallography and gamma ray laboratory is schooled in the processes of photography and the proper exposure and development of x-ray negatives, etc. In addition he is given the same study assignments as the apprentices assigned to metallurgical investigation work. This, of course, leads to the study of Albert Sauveur's text book, *The Metallography and Heat Treatment of Iron and Steel.*

Examined Every 3 Months

As previously mentioned, an examination is given each apprentice at 3-month intervals with a view primarily to finding out how many fundamental facts he has been able to assimilate during the period. As is to be expected, the capability of apprentices to acquire knowledge and retain it in orderly fashion is quite varied and may range from a small amount to a surprisingly rapid understanding of the work of the department. Typical examination questions for our apprentices in their first examination given at the end of about 3 months' training will be presented later. Apprentices who pass the examination are given a 4-cent per hour increase and if they receive a grade of 95 per cent or above they receive a raise of 6 cents per hour.

In the examination covering the first 3 months of the apprenticeship very little attention is paid to the theory. The thought behind the entire first 3 months training is to get the apprentice acclimated, acquainted with the actual manipulation of the laboratory apparatus and general appliances and impress him with a serious sense of responsibility for exactness and accuracy.

The theory and "the reasons why" are left for later examination questions to be submitted as and when he has had the time and opportunity to acquire this knowledge either from those with whom he comes in daily contact, or from his supplementary reading, or from both sources.

In case the apprentice fails to pass the regular examinations his rate of pay remains the same until such time as he can take a "make-up" examination. This is done usually within a month. In case he passes the make-up examination he is given the 4 cents per hour increase effective the pay period immediately following the make-up examination. In case of failure to pass the make-up examination, the apprentice "goes on probation" for another 3 months at no increase in pay over his former hourly rate.

Thus, with the above outlined plan of written examinations every 3 months, it is hoped to stimulate ambitious apprentices into the habit of reading and studying technical papers and trade magazines and texts which deal with the specific division of work which each is following. It is believed that if these men are the proper type and possess the necessary traits they will during their apprenticeship, acquire the habit of reading and study to a point where they will voluntarily wish to continue to do so for the rest of their lives. If on the other hand the interest of the apprentice dwindles, it will soon be forcibly brought to the attention of all concerned through failure to pass the quarterly examinations. To date, our apprenticeship system has not been in vogue long enough to promise success definitely, but the result of the examination papers for the first quarter is very encouraging.

The following suggestions are offered primarily for the new employe entering the service of the laboratory department. All employes, however, should study them carefully and be certain that, through following the simple practices herein outlined, they are setting a proper example for other employes in the department. The adoption of these suggestions will lead to a high grade of excellence, while their rejection may lead to unsatisfactory or careless work and may even be cause for discharge.

Neatness—It is expected that the laboratory floors, fume hoods, table tops and all apparatus be kept scrupulously neat and clean. A sponge should be handy at all times, and table tops, filter stands, etc., should be dry and in good order. Never allow funnels to drip upon the base of the filter stand. Glassware should be wiped with a clean lintless white cloth just before use, and should never be put away in drawers or cupboards without cleaning and polishing both inside and out with a dry lintless cloth. Test tubes, bottles, glass tubing and other pieces of equipment should be cleaned with the special brushes which have been provided for that specific use.

Wash Bottles—Wash bottles for

distilled water, dilute acids, etc., must be labelled clearly. The necks of these bottles should be wound with twine or covered with approved insulation for greater comfort when hot water or hot dilute acid solutions are used. Never place concentrated acids or strong alkalies in wash bottles. If filtered precipitates have to be washed with strong concentrated acids or alkalies use a pipette to drop these hot concentrated acids or alkalies on the filter paper. Do not suck hot concentrated acids or alkalies into a pipette. Rubber suction bulbs have been provided for this purpose.

CRUCIBLES—All crucibles used in analytical determinations, whether platinum, nickel, iron, fused quartz, alundum or porcelain must be heated; and cooled in a desiccator before use. If crucibles are cooled in contact with air, a layer of moisture is condensed on the surface, the amount varying with the humidity of the atmosphere. Under such circumstances parallel conditions in separate weighings could not be insured. In the dry air of the desiccator this difficulty is avoided. Crucibles must be cleaned, heated, desiccated and weighed before each analysis in which they are used.

Platinum crucibles should not be used on routine analyses, except when absolutely necessary. Platinum laboratory ware is extremely valuable and must not be left out in the open when not in use, but must be stored under lock and key.

Constant heating of platinum crucibles causes a slight crystallization of the surface of the platinum, which if not removed by frequent scouring with sea sand, sapolio, bonami, dutch cleanser, etc., penetrates into the crucible. Gentle abrasion of the surface by any of the cleaners will destroy this crystalline structure and prevent further damage and embrittlement of the platinum ware. Care should be taken to keep sea sand and other gritty materials off alberene stone table tops, because when glassware is deposited on these tops it would be scratched easily by the grit and very often subsequently broken on heating.

Platinum ware stained by iron may be cleaned by the use of potassium acid sulphate fusion, or by heating with ammonium chloride. If the former is used, do not heat the crucible too strongly and drive out all the acid radical from the fused salt because the normal sulphate expands so rapidly on cooling as sometimes to burst the crucible.

Compounds of phosphorus or arsenic must not be heated under reducing conditions, since those elements, by contact with the platinum render it brittle.

Liquids containing free chloride, aqua regia, or ferric chloride all exert a solvent action on platinum, the ferric chloride to a lesser degree than the others. Caustic alkalies and peroxides of the alkalies attack platinum freely. Fusions of these fluxes should be made in silver or nickel crucibles—*Never in platinum crucibles!*

EVAPORATION OF LIQUIDS—Loss of constituents in solutions must be avoided carefully during process of evaporation. Too violent boiling, spattering and evolution of gas during the heating must be avoided. Evaporation on the steam bath is to be preferred to other methods as it is impossible on a steam bath to lose any of the substances by spattering. Solutions boiled on the hot plate invariably should be covered by a watch glass supported above the vessel by means of a glass triangle and the danger of loss or contamination by dust be thus avoided.

Heat Cautiously

Liquids which contain precipitates and suspended matter should be cautiously heated to prevent *bumping* with consequent risk to apparatus and analyses. Expelling of acid from solutions by boiling must be conducted in the fume hood. Under no circumstances will this be permitted on the center table or anywhere else than in the fume hoods.

POURING LIQUIDS—Never transfer a liquid from one vessel to another nor to a filter, without the aid of a stirring rod held firmly against the side or lip of the vessel. If the vessel is provided with a lip it is usually unnecessary to use vaseline to prevent the loss of liquid by running down the side, but whenever this seems imminent a very thin application of vaseline applied with the finger to the edge of the vessel will suffice. The stirring rod, down which the liquid runs, should be held firmly and never drawn upward in such a way as to allow the solution to collect on the underside of the rim of a beaker.

REAGENTS AND REAGENT BOTTLES—All reagents (chemicals and solutions) should be labelled clearly and always placed in the same bottles wherever possible. When supplies in the reagent bottles are low, the bottles should be washed carefully, polished and dried before replenishing the materials in such bottles. The stoppers of reagent bottles never should be laid upon the table tops or in the fume hoods unless upon a clean paper or watch glass. Care should be taken to avoid confusion of stoppers in reagent bottles, restoring the proper stopper to the proper reagent bottle to avoid contamination of chemicals and solutions.

This is the first of two articles describing a procedure for training laboratory apprentices which is being used at the Ohio Steel Foundry Co. The second article will appear in an early issue.

THE EDITORS.

Tri-Ply
Foundry Riddle

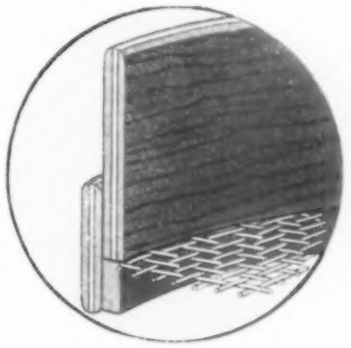
4ways better!

1 **3-PLY FRAME**—An *exclusive* feature. Many times stronger than materials usually found in foundry riddles. One BIG reason why "Tri-Ply" riddles last longer.

2 **SPLIT-PROOF CONSTRUCTION**—3-ply frame material cannot split and "run" with the grain. Another reason why "Tri-Ply" riddles will give added months of useful service.

3 **NO CROSS WIRES**—Special construction, shown below, makes cross wires unnecessary. This feature adds materially to screen life through elimination of extra abrasion.

4 **LONGER LIFE**—They not only look better ("Tri-Ply" riddles are all mahogany stained), but they last longer because of many exclusive, patented construction features.



Made in all meshes and three sizes—16" 18" 20" diameter

Stocked by leading foundry supply houses

SEYMOUR & PECK CO.
P. O. Box 5603 Chicago, Illinois

Tri-Ply
FOUNDRY RIDDLES

COST NO MORE

Buffalo Brand VENT WAX

STANDARD THROUGH THE YEARS

The only molders or coremakers who never used or heard of BUFFALO BRAND VENT WAX were those journeymen who laid down their shovels and riddles before this dependable vent wax came on the market—and that was many, many years ago. For cores or castings, BUFFALO BRAND VENT WAX has few equals, but no superiors. It is used in hundreds of foundries, year in and year out, and we think this wide acceptance is the best testimonial to its utility and dependability than any vent wax ever received from the foundry industry.

Send for a Free Sample

UNITED COMPOUND COMPANY
BUFFALO, N. Y.

LET US ANALYZE YOUR REQUIREMENTS

Processors of

NON-SHATTERING CUT STEEL ABRASIVE
for Blast Cleaning

IMMEDIATE SHIPMENTS

CUT STEEL ABRASIVE, INC.—YOUNGSTOWN, OHIO
P. O. BOX 394 Telephone 77113

Complete Assortments

PROPERLY – CONDITIONED – LUMBER
(we operate our own dry kilns)

PINE — FOR INDUSTRIAL USE — PINE

ALL KINDS—ALL SIZES

Featuring

NORTHERN WHITE PINE & HONDURAS MAHOGANY

WHERE-TO-BUY

The following classified list of advertisers according to products is conducted for the convenience of our readers in quickly locating sources of all types of foundry equipment and supplies. If you are seeking information on any product not listed in this directory, a letter or post card addressed to THE FOUNDRY, Penton Building, Cleveland, will bring you this information by return mail.

ABRASIVE (Bricks and Files)
Abrasive Co., Div. of Simonds Saw & Steel Co., Tacony & Fraley Sts., Philadelphia, Pa.
Bay State Abrasive Products Co., Westboro, Mass.
Carborundum Co., Niagara Falls, N. Y.
Macklin Co., Jackson, Mich.
Norton Co., Worcester, Mass.
Safety Grinding Wheel & Mach. Co., Springfield, Ohio.
Simonds Worden White Co., Dayton, O.
Sterling Grinding Wheel Co., Tiffin, O.

ABRASIVE CLOTH and PAPER
Behr-Manning Div. of Norton Co., Worcester, Mass.
Carborundum Co., Niagara Falls, N. Y.

ABRASIVE WHEELS
Abrasive Co., Div. of Simonds Saw & Steel Co., Tacony & Fraley Sts., Philadelphia, Pa.
Bay State Abrasive Products Co., Westboro, Mass.
Carborundum Co., Niagara Falls, N. Y.
Macklin Company, Jackson, Mich.
Manhattan Rubber Mfg. Div. of Raybestos, Manhattan, Inc., 77 Townsend St., Passaic, N. J.
Norton Company, Worcester, Mass.
Safety Grinding Wheel & Mach. Co., Springfield, Ohio.
Simonds Worden White Co., Dayton, O.
Sterling Grinding Wheel Co., Tiffin, O.
West Co. Inc., 1117 Shackamaxon St., Philadelphia, Pa.

ABRASIVE CUTOFF MACHINES
Tabor Mfg. Co., 6225 Tacony St., Philadelphia, Pa.
Tannewitz Works, Grand Rapids, Mich.

AIR COMPRESSORS
Campbell-Hausfeld Co., Harrison, O.
Chicago Pneumatic Tool Co., 6 East 44th St., New York.
Curtis Pneumatic Machinery Co., 1922 Kienlen Ave., St. Louis, Mo.
Fuller Company, Catasaqua, Pa.
Gardner-Denver Co., Gardner Drive, Quincy, Ill.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
Schramm Inc., 800 N. Garfield Ave., West Chester, Pa.

AIR CONDITIONING EQUIPMENT
American Air Filter Co., Inc., 262 Central Ave., Louisville, Ky.
Claude B. Schneible Co., 3953 Lawrence Ave., Chicago, Ill.
Curtis Pneumatic Machinery Co., 1922 Kienlen Ave., St. Louis, Mo.
Parsons Engineering Corp., Cleveland, O.

AIR CONTROL EQUIPMENT
Air-Way Pump & Equipment Co., 405 S. Jefferson St., Chicago, Ill.
American Air Filter Co., 262 Central Ave., Louisville, Ky.
Foxboro Co., Foxboro, Mass.

AIRLESS BLAST CLEANING EQUIPMENT
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Pangborn Corp., Hagerstown, Md.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

ALLOYS
American Brass Co., 25 Broadway, New York, N. Y.
Climax Molybdenum Co., 500 Fifth Ave., New York, N. Y.
International Nickel Co. Inc., 67 Wall St., New York City.
Molybdenum Corporation of America, Pittsburgh, Pa.
Ohio Ferro-Alloys Corp., Canton, O.

ALLOYS (Ferro)
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.

ANNEALING FURNACES (Electric)
General Electric Co., Schenectady, N. Y.

ANNEALING FURNACES (Gas and Oil)
McCann Furnace Co., 5005 Euclid Ave., Cleveland, O.

AREATORS
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.

ARRESTORS (Dust)
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Pangborn Corp., Hagerstown, Md.

ASSOCIATIONS
American Foundrymens Assoc., 222 W. Adams St., Chicago, Ill.
Crucible Manufacturers Association, 90 West street, New York, N. Y.

BANDS (Snap Flask)
Adams Co., 800 Foster St., Dubuque, Ia.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.

BAND SAWS (High Speed)
Tannewitz Works, Grand Rapids, Mich.

BAND SAWS (Variable Speed)
Tannewitz Works, Grand Rapids, Mich.

BARS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Republic Steel Corp., Cleveland, O.

BEARINGS (Anti-friction, Roller and Ball)
Link Belt Co., 519 N. Holmes Ave., Indianapolis, Ind.

BENTONITE
American Colloid Co., 363 W. Superior St., Chicago, Ill.
Eastern Clay Products, Inc., Elfort, O.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Great Lakes Foundry Sand Co., United Artists Bldg., Detroit, Mich.
F. E. Schundler & Co. Inc., 504 Railroad Ave., Joliet, Ill.

BINS (Storage)
American Bridge Co., Pittsburgh, Pa.
Bethlehem Steel Co., Bethlehem, Pa.

BLACKING (Mold, Core)
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Frederic B. Stevens, Inc., Detroit, Mich.
J. S. McCormick Co., 25th St. & A. V. R. R., Pittsburgh, Pa.
United States Graphite Co., Saginaw, Mich.

BLASTING EQUIPMENT
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
American Steel Abrasives Co., Galion, O.
Dreisbach Engineering Corp., 45 Warburton Ave., Yonkers, N.Y.
Hydro-Blast Corp., 3118 N. Clybourne Ave., Chicago, Ill.
Pangborn Corp., Hagerstown, Md.
Parsons Engineering Co., Cleveland, O.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

BLAST METERS
Foxboro Co., Foxboro, Mass.

BLOWERS
American Air Filter Co., 262 Central Ave., Louisville, Ky.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Campbell-Hausfeld Co., Harrison, O.
Fisher Furnace Co., Dept. B, 1742 N. Kolmar Ave., Chicago, Ill.
General Blower Co., 406 N. Peoria St., Chicago, Ill.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
Mahr Manufacturing Co. Div., Diamond Iron Works Inc., Dept. F-10, Minneapolis, Minn.
North American Mfg. Co., 2910 E. 75th St., Cleveland, O.
Roots-Connersville Blower Corp., 106 Madison Ave., Connersville, Ind.

BOLTS AND NUTS
American Bridge Co., Frick Bldg., Pittsburgh, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Republic Steel Corp., Cleveland, O.

BOND (Clay)
American Colloid Co., 363 W. Superior St., Chicago, Ill.
Eastern Clay Products Inc., Elfort, O.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Great Lakes Foundry Sand Co., United Artists Bldg., Detroit, Mich.
Lawrence Clay Co., Jackson, O.
F. E. Schundler & Co. Inc., 504 Railroad Ave., Joliet, Ill.

BOOKS (Technical)
Penton Publishing Co., 1213 West 3rd St., Cleveland, O.

BOTTOM PLATES and BOARDS
Chicago Mfg. & Distributing Co., 1928 W. 46th St., Chicago, Ill.
Sterling Wheelbarrow Co., 7100 W. Walker St., Milwaukee, Wis.
Truscon Steel Co., 6100 Truscon Ave., Cleveland, O.
Wadsworth Core Machine & Equipt. Co., Akron, O.

BOWLS and SHANKS
Industrial Equipment Co., Minster, O.

BOXES (Tote)
Sterling Wheelbarrow Co., 7100 W. Walker St., Milwaukee, Wis.

BRAKES (Magnetic)
Stearns Magnetic Mfg. Co., 662 S. 28th St., Milwaukee, Wis.

BRICK (Refractory)
Carborundum Co., Niagara Falls, N. Y.
Haws Refractories Co., Johnstown, Pa.
Norton Co., Worcester, Mass.
Ramtite Co., 2563 West 18th St., Chicago, Ill.
Chas. Taylor Sons Co., P. O. Box 58, Annex Sta., Cincinnati, Ohio.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

BRIQUETS (Alloy)
Climax Molybdenum Co., 500 Fifth Ave., New York, N. Y.
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.

BRIQUETS (Ferro Alloy)
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.

BRIQUETS (Silicon Carbide)
Carborundum Co., Niagara Falls, N. Y.

BRIQUETTING MACHINERY (Metal)
Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.

BRUSHES
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.

BUCKETS (Elevating, Clam Shell, Drag Line, Grab, Loader)
Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh, Pa.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

BUILDING and ENGINEERING SERVICE
American Bridge Co., Pittsburgh, Pa.

BURNERS (Acetylene, Oil, Gas, Powdered Coal, Stoker)
Fisher Furnace Co., Dept. B, 1742 N. Kolmar Ave., Chicago, Ill.
Hauck Mfg. Co., 106 Tenth St., Brooklyn, N. Y.
North American Mfg. Co., 2910 E. 75th St., Cleveland, O.

BUSHINGS (Flask Pin)
C. M. Smillie & Co., 520 East Larned St., Detroit, Mich.
Sterling Wheelbarrow Co., 7100 W. Walker St., Milwaukee, Wis.

BUSHINGS (Hammer)
Steel Conversion & Supply Co., Library Road, Castle Shannon, Pittsburgh, Pa.

CALCIUM MOLYBDATE
Climax Molybdenum Co., 500 Fifth Ave., New York, N. Y.
Molybdenum Corporation of America, Pittsburgh, Pa.

CALCIUM BORIDE
Molybdenum Corporation of America, Pittsburgh, Pa.

CASSETTES (X-Ray Film)
Picker X-Ray Corp., 300 Fourth Ave., New York City.

CEMENT (Metallic)
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Frederic B. Stevens, Inc., Detroit, Mich.
Smooth-On Manufacturing Co., 570 Communipaw Ave., Jersey City, N. J.

CEMENT (Refractory)
Bay State Abrasive Products Co., Westboro, Mass.
Carborundum Co., Niagara Falls, N. Y.
Fisher Furnace Co., Dept. B, 1742 N. Kolmar Ave., Chicago, Ill.
Norton Co., Worcester, Mass.
Ramtite Co., 2563 West 18th St., Chicago, Ill.
Chas. Taylor Sons Co., P. O. Box 58, Annex Sta., Cincinnati, Ohio.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

CHAIN (Hoist, Conveyor, Drive, Sling, etc.)
American Chain Division of American Chain & Cable Co., Inc., Bridgeport, Conn.
Chain Belt Co., Milwaukee, Wis.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.

CHAPLETS
Cleveland Chaplet & Mfg. Co., W. 67th St. and N.Y.C. Ry., Cleveland, O.
Combined Supply & Equipment Co. Inc., 215 Chandler St., Buffalo, N. Y.
Fanner Mfg. Co., Brookside Park, Cleveland, O.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Milwaukee Chaplet & Mfg. Co., 1023 So. 40th St., Milwaukee, Wis.
Frederic B. Stevens, Inc., Detroit, Mich.

CHARCOAL (Briquets)
Ford Motor Co., By-Products division, Dearborn, Mich.

CHARGING EQUIPMENT
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill

CHEMICALS
Hercules Powder Co., 999 Market St., Wilmington, Del
The Mathieson Alkali Works, Inc., 60 E. 42nd St., New York, N. Y.

CHEMISTS
Chas. C. Kawin Co., 431 So. Dearborn St., Chicago, Ill
Modern Equipment Co., Dept. 177 Dayton Oil Co., Dayton, O.

CHILLS
Alloy Metal Abrasive Co., 311 W. Huron St., Ann Arbor, Mich.
Chicago Chaplet Co., 2047 N. Wood St., Chicago, Ill.
Fanner Mfg. Co., Brookside Park, Cleveland, O.
Milwaukee Chaplet & Mfg. Co., 1023 So. 40th St., Milwaukee, Wis.

CHILL COATINGS
Dayton Oil Co., Dayton, O.

CHILL COILS
Fanner Mfg. Co., Brookside Park, Cleveland, O.
J. S. McCormick Co., 25th St. & A.V.R.R., Pittsburgh, Pa.

CHROMIUM (Briquets)
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y

CHISELS (Chipping)
Steel Conversion & Supply Co., Library Road, Castle Shannon, Pittsburgh, Pa.

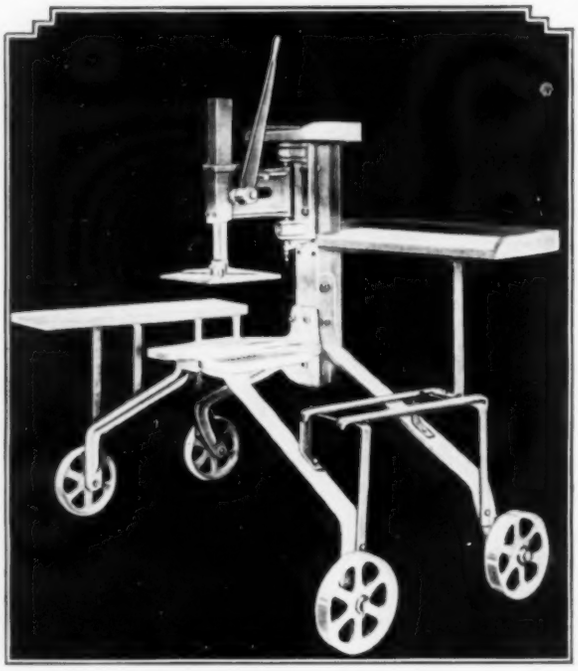
CLAMPS (Flask)
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh, Pa.
Sterling Wheelbarrow Co., 7100 W. Walker St., Milwaukee, Wis.
Truscon Steel Co., 6100 Truscon Ave., Cleveland, O.

—When writing advertisers, please mention THE FOUNDRY—

"WE SHIP QUICK!"

(One Week to 10 Days)

MOLINE SQUEEZERS



285 Molds

DAILY PRODUCTION!

More than 285 molds a day are being made on Moline Squeezers with 12" x 16" flasks in regular production! No. 4 machine, shown above, will handle flasks 16" x 30" or under. Width inside to inside of wheels, 65". Height of table above floor, 30". Table dimensions, 21" x 16". Pressure Plate, 8" x 15" (or furnished 12" x 14"). No extra charge for set-off benches.

4 MODELS TO CHOOSE FROM

Moline Iron Works

MOLINE, ILL., U.S.A.

WHERE-TO-BUY

CLAY (Bonding)
American Colloid Co., 363 W. Superior St., Chicago, Ill.
Eastern Clay Products, Inc., Eifort, O.
The Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Illinois Clay Products Co., Joliet, Ill.
The Lawrence Clay Co., Jackson, O.
F. E. Schundler & Co. Inc., 504 Railroad Ave., Joliet, Ill.

CLEANING COMPOUNDS (Window, etc.)
Hercules Powder Co., 999 Market St., Wilmington, Del.

CLUTCHES (Magnetic)
Stearns Magnetic Mfg. Co., 662 S. 28th St., Milwaukee, Wis.
Dings Magnetic Separator Co., 512 E. Smith St., Milwaukee, Wis.

COAL (Foundry)
Republic Coal & Coke Co., 8 So. Michigan Ave., Chicago, Ill.

COKE (Foundry)
Hickman-Williams & Co., Cleveland, O.
Pickands, Mather & Co., Cleveland, O.
Republic Coal & Coke Co., 8 So. Michigan Ave., Chicago, Ill.

COLLECTORS (Dust)
American Air Filter Co., 262 Central Ave., Louisville, Ky.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Buell Engineering Co., 14 Cedar St., New York City.
Industrial Sheet Metal Wks., 325 E. Forest Ave., Detroit, Mich.
Pangborn Corp., Hagerstown, Md.
Claude B. Schneible Co., 3953 Lawrence Ave., Chicago, Ill.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

COMBUSTION EQUIPMENT
North American Mfg. Co., 2910 E. 75th St., Cleveland, O.

CONTAINERS (Shipping)
Seymour & Peck Co., P. O. Box 5609, Chicago, Ill.

CONTROL SYSTEMS (Dust)
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
American Air Filter Co., 223 Central Ave., Louisville, Ky.
Buell Engineering Co., 14 Cedar St., New York City.
Pangborn Corp., Hagerstown, Md.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

CONVERTER BLOWERS
Roots-Connersville Blower Corp., 106 Madison Ave., Connersville, Ind.

CONVEYORS (Belt)
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Mahr Mfg. Co., Div., Diamond Iron Wks. Inc., Dept. FS, Minneapolis, Minn.
The Manhattan Rubber Mfg. Div. of Raybestos, Manhattan, Inc., 77 Townsend St., Passaic, N. J.
Mathews Conveyer Co., 104 Tenth St., Ellwood City, Pa.
Robins Conveying Belt Co., Passaic, N. J.
Standard Conveyor Co., North St. Paul, Minn.

CONVEYORS (Chain)
Chain Belt Co., Milwaukee, Wis.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Mathews Conveyer Co., 104 Tenth St., Ellwood City, Pa.
Standard Conveyor Co., North St. Paul, Minn.

CONVEYORS (Gravity)
Chain Belt Co., Milwaukee, Wis.
Mathews Conveyer Co., 104 Tenth St., Ellwood City, Pa.
Standard Conveyor Co., North St. Paul, Minn.

CONVEYORS (Live Roller)
Chain Belt Co., Milwaukee, Wis.
Standard Conveyor Co., North St. Paul, Minn.

CONVEYORS (Magnetic)
Stearns Magnetic Mfg. Co., 662 S. 28th St., Milwaukee, Wis.

CONVEYORS (Monorail)
American Monorail Co., 13104 Athens Ave., Cleveland, O.
Chain Belt Co., Milwaukee, Wis.

CONVEYORS (Monorail)—Cont'd.
Chicago Tramrail Co., 2910 Carroll Ave., Chicago, Ill.
Cleveland Tramrail Div. of Cleveland Crane & Engineering Co., 1155 East 283rd St., Wickliffe, O.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Mathews Conveyer Co., 104 Tenth St., Ellwood City, Pa.

CONVEYORS (Pneumatic)
Fuller Company, Catasaqua, Pa.

CONVEYORS (Rubber)
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.
Standard Conveyor Co., North St. Paul, Minn.

CONVEYORS (Vibrating)
Ajax Flexible Coupling Co., Westfield, N. Y.
Syntron Company, Homer City, Pa.

COPPER SHOT
Alloy Metal Abrasive Co., 311 W. Huron St., Ann Arbor, Mich.

CORE BINDERS
American Gum Products Co., 500 Fifth Ave., New York, N. Y.
Corn Products Sales Co., 17 Battery Pl., New York City.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Hercules Powder Co., 999 Market St., Wilmington, Del.
International Paper Co., 220 E. 42nd St., New York City.
J. S. McCormick Co., 25th St. & A.V.R.R., Pittsburgh, Pa.
Robeson Process Co., 500 Fifth Ave., New York.
The Werner G. Smith Co., (Div. of Archer-Daniels-Midland Co.), 2191 W. 110th St., Cleveland, O.
Frederic B. Stevens, Inc., Detroit, Mich.

CORE BLOWING MACHINES
Champion Foundry & Machine Co., 1314 West 21st St., Chicago, Ill.
Wm. Demmler & Bros., Kewanee, Ill.
International Molding Machine Co., 2608 W. 16th St., Chicago, Ill.
Wm. H. Nicholls Co., Richmond Hill, Long Island, N. Y.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.

CORE BREAKERS
Cleveland Pneumatic Tool Co., 3734 East 78th St., Cleveland, O.

CORE COMPOUND
The Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
International Paper Co., 220 E. 42nd St., New York City.
The Werner G. Smith Co., (Div. of Archer-Daniels-Midland Co.), 2191 W. 110th St., Cleveland, O.
J. S. McCormick Co., 25th St. & A.V.R.R., Pittsburgh, Pa.
Smith Facing & Supply Co., 1857 Carter Rd., Cleveland, O.
Frederic B. Stevens, Inc., Detroit, Mich.
E. J. Woodison Co., 7415 St. Aubin Ave., Detroit, Mich.

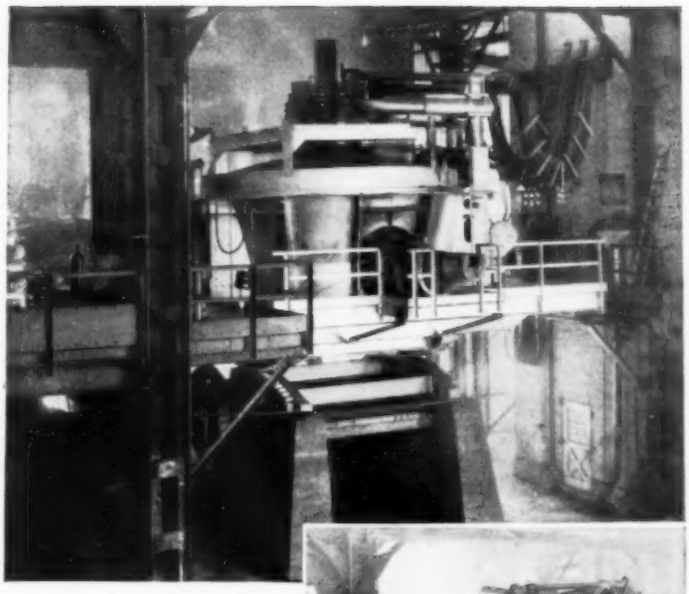
CORE CUTTING and CONING MACHINES
Wadsworth Core Machine & Equipt. Co., Akron, O.

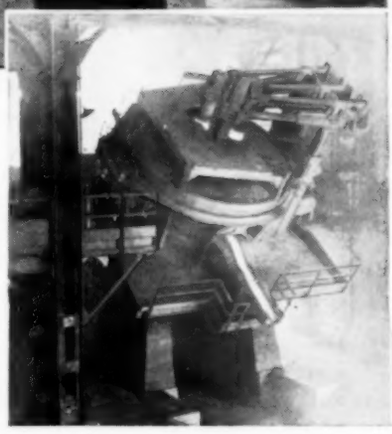
CORE GRINDERS (Power Operated)
Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.

CORE KNOCKOUT MACHINES
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Hydro-Blast Corp., 3118 N. Clybourne Ave., Chicago, Ill.
Pangborn Corp., Hagerstown, Md.
Simplicity Engineering Co., Durand, Mich.

CORE MAKING MACHINES
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.
Davenport Machine & Foundry Co., Davenport, Iowa
Wm. Demmler & Bros., Kewanee, Ill.
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh, Pa.
International Molding Machine Co., 2608 W. 16th St., Chicago, Ill.
Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.
Wadsworth Core Machine & Equipt. Co., Akron, O.

—When writing advertisers, please mention THE FOUNDRY—





Illustrated is a recent installation of a 25-ton Heroult Furnace with many special features. It is an all-welded unit equipped with 18-inch electrodes. The platform is attached to the shell — tilts when pouring. The shell is flared from floor level to roof — materially increasing scrap capacity.

Heroult
ELECTRIC FURNACES

AMERICAN BRIDGE Heroult Electric Furnaces now embody novel and distinctive features—the result of constant striving to perfect the most modern and economical tool for efficient melting and refining of iron and steel for castings, high grade alloy, tool and stainless steels.

Dependent on size and operating requirements they are adaptable to hand, chute, machine or drop-bottom bucket charging. Capacity ratings range from ½ to 100 tons.

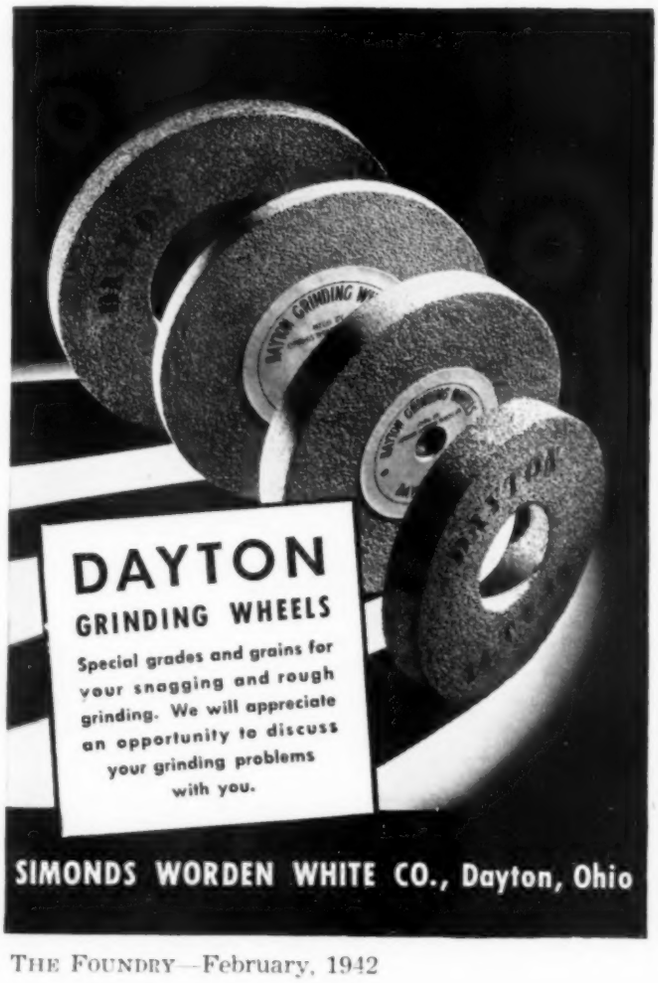
Why not avail yourself of the specialized experience of our furnace engineers for your specific requirements.

AMERICAN BRIDGE COMPANY

General Offices: Frick Building, Pittsburgh, Pa.

Baltimore · Boston · Chicago · Cincinnati · Cleveland · Denver
Detroit · Duluth · Minneapolis · New York · Philadelphia · St. Louis
Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
United States Steel Export Company, New York

UNITED STATES STEEL


DAYTON
GRINDING WHEELS
Special grades and grains for your snagging and rough grinding. We will appreciate an opportunity to discuss your grinding problems with you.
SIMONDS WORDEN WHITE CO., Dayton, Ohio

Announcing . . . . . .

3000 tons Daily Capacity of

DOLOMITIC LIMESTONE of LOW SILICON content

MONTHLY ANALYSIS OF DOLESE LOW-SILICON DOLOMITE

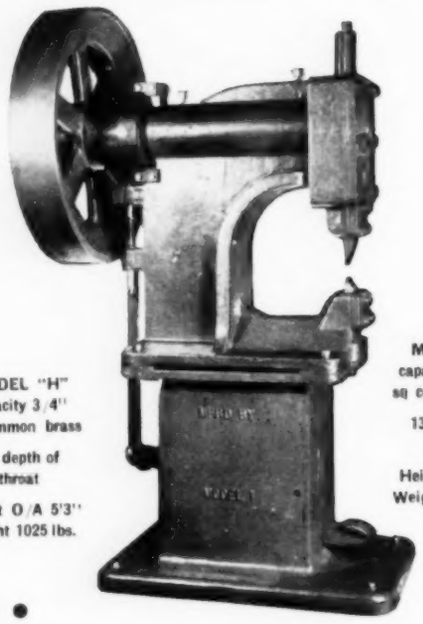
	Iron	Phos.	Silicon	Alumina	Lime	Magnesia	Sulphur
Jan.	.20	.005	.35	.32	30.94	20.98	.028
Feb.	.24	.005	.52	.30	30.80	21.02	.037
Mar.	.22	.004	.39	.35	31.01	20.88	.027
Apr.	.20	.006	.37	.31	31.08	20.84	.038
May	.21	.004	.36	.30	30.87	20.95	.030
June	.24	.004	.35	.30	30.74	21.10	.030
July	.26	.006	.62	.32	30.71	21.06	.050
Aug.	.18	.005	.33	.20	30.58	21.31	.033
Sept.	.17	.005	.36	.26	30.91	20.88	.033
Oct.	.25	.007	.55	.22	30.94	20.68	.027
Nov.	.20	.005	.77	.45	31.08	20.49	.040
Dec.	.24	.004	.50	.26	31.01	20.68	.033

Here is a low-silicon dolomitic limestone ideally suited to foundry use. Graded in size to suit your particular requirements, it may be obtained in any quantity for immediate delivery. Quarry is located within the Chicago switching district where shipment may be made direct to you by rail. Truck shipment to immediate Chicago area. We solicit your inquiries.

DOLESE & SHEPARD COMPANY

111 West Washington St. Phone: Central 9488 Chicago, Ill.

"Scully-Jones"
POWER SPRUE CUTTERS



MODEL "H"
capacity 3/4"
sq common brass
9" depth of
throat
Height O/A 5'3"
Weight 1025 lbs.

MODEL "I"
capacity 1-1/4"
sq common brass
13" depth of
throat
Height O/A 6 ft
Weight 2400 lbs.

SCULLY-JONES & COMPANY
(*Foundry Division*)
1913 S. Rockwell St. Chicago, Illinois

Adolph I. Buehler
OPTICAL INSTRUMENTS • METALLURGICAL APPARATUS
228 NORTH LA SALLE ST. • • CHICAGO ILL.

Do you have a copy?

We invite readers of THE FOUNDRY to write for a complimentary copy of this complete catalog which has been prepared as a comprehensive review of all types of equipment and supplies for metallurgical testing in the foundry. In addition, it contains chapters devoted to a technical discussion of "THE APPLICATION OF REFLECTED LIGHT," and a comprehensive listing of books and articles on metallurgical subjects. An invaluable addition to the foundryman's library—send for your copy today.

▼ ▼
FILL IN THE COUPON
That's all!
▼ ▼

100 PAGES—SPIRAL BOUND

ADOLPH I. BUEHLER,
228 No. La Salle St., Chicago, Ill.

PLEASE SEND US A COPY OF YOUR COMPLETE METALLURGICAL CATALOG

Name _____

Title _____

Company _____

City and State _____

WHERE-TO-BUY

CORE OIL
Dayton Oil Co., Dayton, O.
Werner G. Smith Co., (Div. of Archer-Daniels-Midland Co.), 2191 W. 110th St., Cleveland, O.
Frederic B. Stevens, Inc., Detroit, Mich.
E. J. Woodison Co., 7415 St. Aubin Ave., Detroit, Mich.

CORE OVENS
Carl-Mayer Corp., 3030 Euclid Ave., Cleveland, O.
Despatch Oven Co., Minneapolis, Minn.
Foundry Equipment Co., Cleveland, O.
Gehnrich Corporation, 42-11 35th St., Long Island City, N. Y.
George Koch Sons, Inc., 2124 W. Pennsylvania St., Evansville, Ind.
Lanly Company, 750 Prospect Ave., Cleveland, O.
Paul Maehler Co., 2200 W. Lake St., Chicago, Ill.
Mahr Mfg. Co., Div. of Diamond Iron Works Inc., Dept. F8, Minneapolis, Minn.
McCann Furnace Co., 5005 Euclid Ave., Cleveland, O.
Porbeck Mfg. Co., 2019 N. Broadway, St. Louis, Mo.
Young Brothers Co., 6508 Mack Ave., Detroit, Mich.

CORE PASTE
Corn Products Sales Co., 17 Battery Pl., New York City.
Dayton Oil Co., Dayton, O.
Eastern Clay Products, Inc., Elfort, O.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
J. S. McCormick Co., 25th St. & A.V.R.R., Pittsburgh, Pa.
Midwest Foundry Supply Co., Edwardsville, Ill.

CORE PLATES (Steel, Asbestos)
Diamond Clamp & Flask Co., Richmond, Ind.
Johns-Manville, 22 East 40th St., New York City.
Sterling Wheelbarrow Co., 7100 W. Walker St., Milwaukee, Wis.
Truscon Steel Co., 6100 Truscon Ave., Cleveland, O.
Wadsworth Core Machine & Equipt. Co., Akron, O.

CORE RODS
Bethlehem Steel Co., Bethlehem, Pa.

CORE ROD STRAIGHTENING and CUTTING MACHINERY
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Kane & Roach, Syracuse, N. Y.

CORE SAND
Great Lakes Foundry Sand Co., United Artists Bldg., Detroit, Mich.
Hougland & Hardy Inc., Evansville, Ind.
Ottawa Silica Co., Ottawa, Ill.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

CORE SAND MIXERS
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Clearfield Machine Co., Clearfield, Pa.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Royer Foundry & Machine Co., Kingston, Pa.

CORE VENTS
Wm. Demmler & Bros., Kewanee, Ill.
C. M. Smillie & Co., 520 East Larned St., Detroit, Mich.
United Compound Co., Inc., 328 South Park Ave., Buffalo, N. Y.

CORE WASH
Carborundum Co., Niagara Falls, N. Y.
Corn Products Sales Co., 17 Battery Pl., New York City.
Dayton Oil Co., Dayton, O.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Foundry Services Inc., 280 Madison Ave., New York, N. Y.
J. S. McCormick Co., 25th St. & A.V.R.R., Pittsburgh, Pa.
Pollard Oil Products Co., 1627 So. 44th St., Milwaukee, Wis.
Refractory Mica Products Inc., 500 Chancellor Ave., Irvington, N. J.
Smith Facing & Supply Co., 1857 Carter Rd., Cleveland, O.
Frederic B. Stevens, Inc., Detroit, Mich.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
United States Graphite Co., Saginaw, Mich.

CORE WIRE CUTTERS
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.

CORE WIRE STRAIGHTENERS
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.

COUPLINGS (Flexible)
Ajax Flexible Coupling Co., Westfield, N. Y.
Chain Belt Co., Milwaukee, Wis.

CRANES (Bucket)
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

CRANE LUBRICATING SYSTEMS
Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh, Pa.

CRANES (Electric Traveling)
American MonoRail Co., 13104 Athens Ave., Cleveland, O.
Cleveland Tramrail Div. of Cleveland Crane & Engineering Co., 1155 East 283rd St., Wickliffe, O.
Shepard-Niles Crane & Hoist Corp., 360 Schuyler Ave., Montour Falls, N. Y.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.
Wright Manufacturing Division of American Chain & Cable Co., Inc.,

CRANES (Gantry)
Modern Equipment Co., Dept. 187, Port Washington, Wis.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

CRANES (Hand Traveling)
American MonoRail Co., 13104 Athens Ave., Cleveland, O.
Chicago Tramrail Co., 2910 Carroll Ave., Chicago, Ill.
Cleveland Tramrail Div. of Cleveland Crane & Engineering Co., 1155 East 283rd St., Wickliffe, O.
Modern Equipment Co., Dept. 187, Port Washington, Wis.
Shepard-Niles Crane & Hoist Corp., 360 Schuyler Ave., Montour Falls, N. Y.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

CRANES (Jib)
American MonoRail Co., 13104 Athens Ave., Cleveland, O.
Chicago Tramrail Co., 2910 Carroll Ave., Chicago, Ill.
Modern Equipment Co., Dept. 187, Port Washington, Wis.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

CRANES (Monorail)
American Engineering Co., 2418 Aramingo St., Philadelphia, Pa.
American MonoRail Co., 13104 Athens Ave., Cleveland, O.
Chicago Tramrail Co., 2910 Carroll Ave., Chicago, Ill.
Cleveland Tramrail Div. of Cleveland Crane & Engineering Co., 1155 East 283rd St., Wickliffe, O.
Shepard-Niles Crane & Hoist Corp., 360 Schuyler Ave., Montour Falls, N. Y.
Modern Equipment Co., Dept. 187, Port Washington, Wis.

CRUCIBLES
American Crucible Co., Shelton, Conn.

CRUCIBLES (Cont'd.)
Electro Refractories & Alloys Corp., Buffalo, N. Y.
Joseph Dixon Crucible Co., Jersey City, N. J.
Lava Crucible Co., Pittsburgh, Pa.
Ross-Tacony Crucible Co., Tacony, Philadelphia, Pa.
Vesuvius Crucible Co., Swissvale, Pa.

CRUCIBLE FURNACES
Campbell-Hausfeld Co., Harrison, O.
Fisher Furnace Co., Dept. B, 1742 N. Kolmar Ave., Chicago, Ill.

CRUCIBLE LIFTERS
Modern Equipment Co., Dept. 187, Port Washington, Wis.

CRUCIBLE POURING DEVICES
Modern Equipment Co., Dept. 187, Port Washington, Wis.

CRUSHERS & PULVERIZERS (Coal)
Jeffrey Mfg. Co., 907 N. Fourth St., Columbus, O.

CUPOLAS
Tabor Mfg. Co., 6225 Tacony St., Philadelphia, Pa.
6225 Tacony St., Philadelphia, Pa.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

CUPOLA BLOWERS
Roots-Connersville Blower Corp., 106 Madison Ave., Connersville, Ind.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.

—*When writing advertisers, please mention* THE FOUNDRY—

CLEANBLAST

TEMPERED SHOT AND GRIT

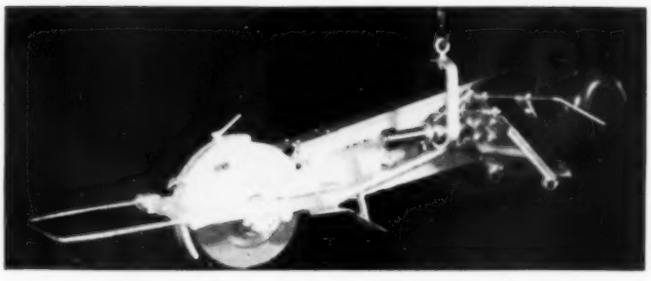
A VITAL AID TO THE NATIONAL DEFENSE PRODUCTION PROGRAM

Using "Cleanblast" Shot & Grit is Standard Practice!

ALLOY METAL ABRASIVE COMPANY

311 W. HURON ST. ANN ARBOR, MICHIGAN

FOX HI-SPEED SWING FRAME GRINDERS



This Fox 20" rugged swing frame grinder is easy to handle, economical in its upkeep. Removes maximum amount of metal at minimum cost. Guaranteed against repair for two years, it will make an efficient addition to your foundry operations.

•

Send for full descriptive material and prices:

Our catalog contains a wealth of pertinent information concerning Fox Hi-Speed swing frame grinders. Ask us for it.

FOX GRINDERS, INC., Oliver Building, PITTSBURGH, PA., U. S. A.

PATTERN LUMBER

Dougherty perfect pattern lumber is stored in a heated warehouse—and is fully conditioned to an average of 6% moisture content. All grades ready for immediate use.

BY THE CARLOAD OR PART CARLOAD

FLASK LUMBER

Let Dougherty's dependable flask lumber guard and control your expensive casting jobs. Many grades available for immediate delivery.

DOUGHERTY LUMBER COMPANY

4300 East 68th Street • Cleveland, Ohio

The LEADING MANUFACTURER OF CORE BOX VENTS

Made of brass, the SMILLIE AIR RELEASE VENT has .012 slots milled in the head. The number of slots increases with the diameter, thus giving greater area for the quick escape of air. Head of vent is .093 deep and may be machined to fit any contour without removal from the plate.

Diameter is held to close tolerance, making it easily assembled in the box or plate. We stock all sizes for immediate shipment, and are always pleased to submit samples. Learn how to eliminate drops, pockets and uneven contours by finding out more about SMILLIE CORE BOX AIR RELEASE VENTS.

C. M. SMILLIE & CO.
520 EAST LARNED ST.
DETROIT, MICH.

HAWS REFRACTORIES COMPANY

Johnstown, Pa.

PIONEER
MANUFACTURERS OF

SILICA BRICK
FIRE BRICK
SLEEVES
NOZZLES
RUNNER BRICK
HOT TOPS
FIRE CLAY &
SILICA CEMENT

—— BRANCH OFFICES ——

General Motors Bldg.
Detroit, Mich.
Phone Trinity 1-1140

Farmers Bank Building
Pittsburgh, Penna.
Phone Atlantic 1656

WHERE-TO-BUY

CUPOLA CHARGING MACHINES
American Monorail Co., 13104 Athens Ave., Cleveland, O.
Modern Equipment Co., Dept. 187, Port Washington, Wis.
Shepard-Niles Crane & Hoist Corp., 360 Schuyler Ave., Montour Falls, N. Y.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

CUPOLA CONTROL EQUIPMENT
Edwin S. Carman, Lee Rd. at Mayfield, Cleveland, O.
Foxboro Co., Foxboro, Mass.

CUPOLA DUST ARRESTORS
Claude B. Schneible Co., 3953 Lawrence Ave., Chicago, Ill.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

CUPOLA LIGHTERS
Hauck Mfg. Co., 106 Tenth St., Brooklyn, N. Y.

CUPOLA LININGS
Carborundum Co., Niagara Falls, N. Y.
Haws Refractories Co., Johnstown, Pa.
Ramtite Co., 2563 West 18th St., Chicago, Ill.
Chas. Taylor Sons Co., P. O. Box 58, Annex Sta., Cincinnati, Ohio.
United States Graphite Co., Saginaw, Mich.

CUTOFF MACHINES (Abrasive)
Fox Grinders Inc., Oliver Bldg., Pittsburgh, Pa.
Tabor Mfg. Co., 6225 Tacony St., Philadelphia, Pa.

CYLINDERS (Air, Hydraulic)
Galland-Henning Mfg. Co., 2761 So. 31st St., Milwaukee, Wis.

DARK ROOM ACCESSORIES (X-Ray)
Picker X-Ray Corp., 300 Fourth Ave., New York City.

DARK ROOM PROCESSING (Chemical Tanks, etc.)
Picker X-Ray Corp., 300 Fourth Ave., New York City.

DEGASIFIERS
Foundry Services Inc., 280 Madison Ave., New York, N. Y.

DESULPHURIZERS
Hercules Powder Co., 999 Market St., Wilmington, Del.
Mathieson Alkali Works, Inc., 60 E. 42nd St., New York, N. Y.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

DRILLS (Pneumatic)
Cleveland Pneumatic Tool Co., 3734 East 78th St., Cleveland, O.
Gardner-Denver Co., Gardner Drive, Quincy, Ill.

DRILL PRESSES
Delta Mfg. Co., Industrial Div., 695 E. Vienna Ave.,

DRIVES (Chain)
Chain Belt Co., Milwaukee, Wis.

DRIVES (Reciprocating)
Ajax Flexible Coupling Co., Westfield, N. Y.

DRUMS (Magnetic)
Dings Magnetic Separator Co., 512 E. Smith St., Milwaukee, Wis.
Stearns Magnetic Mfg. Co., 662 S. 28th St., Milwaukee, Wis.

DUMP HOPPERS
Roura Iron Works, 1405 Woodland Ave., Detroit, Mich.

DUST ARRESTING EQUIPMENT
American Air Filter Co., Inc., 262 Central Ave., Louisville, Ky.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.
Buell Engineering Co., 14 Cedar St., New York, N. Y.
Claude B. Schneible Co., 3953 Lawrence Ave., Chicago, Ill.
Pangborn Corp., Hagerstown, Md.
Parsons Engineering Corp., Cleveland, O.
Ruemelin Mfg. Co., 3850 N. Palmer St., Milwaukee, Wis.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.
Tabor Mfg. Co., 6225 Tacony St., Philadelphia, Pa.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.

ELEVATORS
Standard Conveyor Co., North St. Paul, Minn.

ELEVATORS (Bucket)
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.

ELEVATORS (Bucket)—Cont'd.
[illegible] Rubber Mfg. Div. of Raybestos Manhattan Inc., Passaic, N. J.

ELEVATORS (Material Handling)
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.

ELEVATORS (Pneumatic, Material Handling)
Fuller Company, Catasaqua, Pa.

ENGINEERING SERVICE (Foundry)
Edwin S. Carman, Lee Rd. at Mayfield, Cleveland, O.
Chas. C. Kawin Co., 431 S. Dearborn St., Chicago, Ill.
Herbert F. Miller Jr., P. O. Box 1976, Cleveland, O.
A. A. Wickland Co., 205 W. Wacker Dr., Chicago, Ill.

EXHAUST SYSTEMS
American Air Filter Co., Inc., 262 Central Ave., Louisville, Ky.
Pangborn Corporation, Hagerstown, Md.
Parsons Engineering Co., Cleveland, O.
Claude B. Schneible Co., 3953 Lawrence Ave., Chicago, Ill.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

FABRICATORS (Metal)
Roura Iron Works, 1405 Woodland Ave., Detroit, Mich.

FACINGS
Frederic B. Stevens, Inc., Detroit, Mich.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Refractory Mica Products Inc., 500 Chancellor Ave., Irvington, N. J.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
United States Graphite Co., Saginaw, Mich.
E. J. Woodison Co., 7415 St. Aubin Ave., Detroit, Mich.

FANS (Ventilating, Exhaust, Cooling, etc.)
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
General Blower Co., 406 N. Peoria St., Chicago, Ill.
Pangborn Corp., Hagerstown, Md.

FEEDERS (Rotary)
Fuller Company, Catasaqua, Pa.

FEEDERS (Sand)
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.

FERROCHROME
Hickman-Williams & Co., Cleveland, O.
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.
Ohio Ferro-Alloys Corp., Canton, O.
Vanadium Corp. of America, 420 Lexington Ave., New York, N. Y.

FERROMANGANESE
Bethlehem Steel Co., Bethlehem, Pa.
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.
Ohio Ferro-Alloys Corp., Canton, O.

FERROMOLYBDENUM
Climax Molybdenum Co., 500 Fifth Ave., New York, N. Y.
Molybdenum Corporation of America, Pittsburgh, Pa.

FERROSILICON
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.
Jackson Iron & Steel Co., Jackson, O.
Ohio Ferro-Alloys Corp., Canton, O.
Vanadium Corp. of America, 420 Lexington Ave., New York, N. Y.

FERROTITANIUM
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
Vanadium Corp. of America, 420 Lexington Ave., New York, N. Y.

FERROTUNGSTEN
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.

FERROVANADIUM
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.
Vanadium Corp. of America, 420 Lexington Ave., New York, N. Y.

—When writing advertisers, please mention THE FOUNDRY*—*

More Production—Less Effort *with*

MANHATTAN

V.D.B. ABRASIVE WHEELS

Patent No. 2,187,350

Vibration Dampener Bushings—V. D. B.—a unique patented device available with MANHATTAN Abrasive Wheels for portable grinders. They reduce fatigue, improve speed and accuracy.

V. D. B.'s ten important advantages repay early trial. Write for descriptive folder and then try V. D. B.-equipped MANHATTAN Abrasive Wheels.

ABRASIVE WHEEL DEPARTMENT

THE MANHATTAN RUBBER MFG. DIVISION

OF RAYBESTOS-MANHATTAN, INC.

Executive Offices and Factories—77 Townsend St., Passaic, N.J.

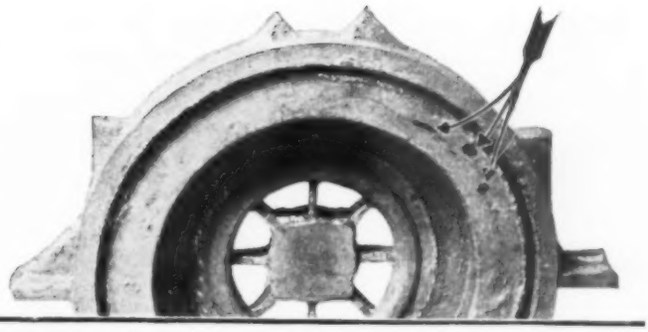
ESTABLISHED 1788

THE E. & G. BROOKE IRON COMPANY

Manufacturers of

Basic, Malleable, Foundry, Forge and Low Phosphorus Pig Iron

BIRDSBORO, PENNSYLVANIA



How SMOOTH-ON helps to prevent production delays

A scrapped casting can badly upset a foundry production schedule. Sometimes the scrapping may be necessary because of a serious flaw. However, when the casting has only minor surface imperfections that do not affect its strength, you are unfair to yourself, especially today when foundry time is so valuable, if you send it to the scrap heap.

By using SMOOTH-ON Foundry Cement to restore the correct surface contour, you make the appearance of a high-grade casting do justice to its real soundness, and protect yourself from unnecessary production delays.

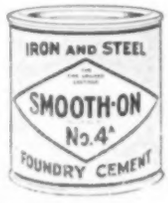
SMOOTH-ON is made in three grades, which permit exact match of the color and grain of any iron or steel casting.

Smooth-On No. 4AA. For light gray castings and machined surfaces. Has high metallic lustre and takes a fine machine finish.

Smooth-On No. 4A. For medium gray castings. A fine-grained cement with good metallic lustre.

Smooth-On No. 4B. For dark gray castings. A cement of coarser grain and darker shade.

Smooth-On No. 4AA is packed in 1-lb. can, 10-lb. and 50-lb. kegs. Smooth-On Nos. 4A and 4B is packed in 1-lb. and 5-lb. can, 25-lb. pail or 100-lb. keg. For your protection, insist on Smooth-On, used by foundrymen since 1895



FREE

Hardened and Working Samples

also

The Smooth-On Repair Handbook

40 Pages 170 Diagrams

Describes dozens of emergency repairs and routine maintenance hints that save time and money. Your copy sent free if you mail the coupon.

Smooth-On Manufacturing Co., Dept. 17,
570 Communipaw Ave., Jersey City, N. J.

Please send the free Smooth-On Repair Handbook, and *working* samples of

☐ Smooth-On No. 4AA ☐ Smooth-On No. 4A ☐ Smooth-On No. 4B

☐ Hardened samples of all three.

Name.....

Address.....

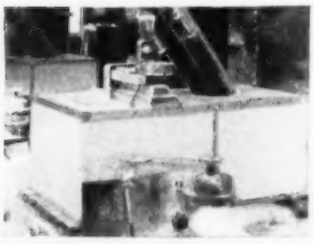
2-42

Do it with **SMOOTH-ON**

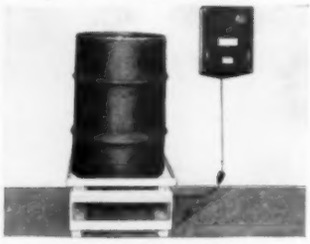
Put *"VIBRATION"* To Work
MOVING MATERIALS THE EASY WAY

ELECTRO-MAGNET VIBRATORS
Open Up "Constipated" Bins and Chutes

VIBRATORY FEEDERS
From lbs. to tons per hour by the twist of a Rheostat.



GRAVIMETRIC FEEDERS
Weigh Feed Material to a 99% Accuracy.



VIBRATING PACKERS
Increase the Net Contents of barrels, drums, etc.

Write for New 1942 Catalogue

SYNTRON CO.

540 Lexington Ave. **Homer City, Pa.**

CARMAN ENGINEERS

STEEL FOUNDRY PRODUCTION INCREASED

Layouts, Drawings and Specifications covering complete new Steel Foundries and Rearrangement of Present Plants. Studies by departments to produce from 20% to 25% more.

REARRANGEMENT means INCREASED PRODUCTION and LOWER COSTS

EDWIN S. CARMAN, INC.
Foundry Engineers and Consultants
LEE RD. AND MAYFIELD—CLEVELAND, OHIO

For Heat Treating, Drying, Melting
HAUCK OIL BURNERS

For CUPOLA LIGHTING
HEATING LADLES
DRYING MOLDS
For CORE OVENS, ANNEALING and HEAT TREATING FURNACES

HAUCK MANUFACTURING COMPANY
106 TENTH ST. BROOKLYN, N. Y.

WHERE-TO-BUY

FILMS (X-Ray)
Picker X-Ray Corp., 300 Fourth Ave., New York City.

FILTERS (Air)
American Air Filter Co., 262 Central Ave., Louisville, Ky.

FIRE BRICK
Frederic B. Stevens, Inc., Detroit, Mich.
Haws Refractories Co., Johnstown, Pa.
Illinois Clay Products Co., Joliet, Ill.
Norton Co., Worcester, Mass.
Chas. Taylor Sons Co., P. O. Box 58, Annex Sta., Cincinnati, Ohio.
West Virginia Fire Clay Mfg. Co., Diamond Bank Bldg., Pittsburgh, Pa.

FIRE CLAY
Eastern Clay Products, Inc., Eifort, O.
Great Lakes Foundry Sand Co., United Artists Bldg., Detroit, Mich.
Illinois Clay Products Co., Joliet, Ill.
Lawrence Clay Co., 112 Columbia St., Jackson, O.
Chas. Taylor Sons Co., P. O. Box 58, Annex Sta., Cincinnati, Ohio.
West Virginia Fire Clay Mfg. Co., Diamond Bank Bldg., Pittsburgh, Pa.

FIRE SAND
Carborundum Co., Niagara Falls, N. Y.

FIRESTONE
Cleveland Quarries Co., 1125 Builders Exchange Bldg., Cleveland, O.

FLASKS (Aluminum)
Adams Co., 700 Foster St., Dubuque, Ia.
The American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.

FLASKS (Dowmetal)
American Foundry Equipment Co., 505 So. Byrkit St., Mishawaka, Ind.

FLASKS (Slip)
Adams Co., 700 Foster St., Dubuque, Ia.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.

FLASKS (Snap)
Adams Co., 700 Foster St., Dubuque, Iowa.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind
Arcade Manufacturing Co., Freeport, Ill.
Diamond Clamp & Flask Co., Richmond, Ind.
Frederic B. Stevens, Inc., Detroit, Mich.

FLASKS (Steel)
Sterling Wheelbarrow Co., 7100 W. Walker St., Milwaukee, Wis.
Truscon Steel Co., 6100 Truscon Ave., Cleveland, O.

FLASKS (Tapered)
Adams Co., 700 Foster St., Dubuque, Ia.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.

FLASK FITTINGS
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Truscon Steel Co., 6100 Truscon Ave., Cleveland, O.

FLASK LUMBER
Dougherty Lumber Co., 4300 E. 68th St., Cleveland, O.
Reitz Lumber Co., 1800 N. Central Park Ave., Chicago, Ill.
Thomas & Proetz Lumber Co., 3400 N. Hall St., St. Louis, Mo.

FLASKS (Wood)
Chicago Mfg. & Distributing Co., 1928 W. 46th St., Chicago, Ill.

FLEXIBLE SHAFT MACHINERY
Mall Tool Co., 7720 South Chicago Ave., Chicago, Ill.
Stow Mfg. Co., 23 Shear St., Binghamton, N. Y.

FLOORING (Non-Slip)
Norton Co., Worcester, Mass.

FLUXES
Dolese & Shepard Co., 111 W. Washington St., Chicago, Ill.
Foundry Services Inc., 280 Madison Ave., New York N. Y.
Mathieson Alkali Works, Inc., 60 E. 42nd St., New York, N. Y

FOUNDRY SUPPLY HOUSES
Combined Supply & Equipment Co. Inc., 215 Chandler St., Buffalo, N. Y.
Eastern Clay Products, Inc., Eifort, O.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Midwest Foundry Supply Co., Edwardsville, Ill.
Frederic B. Stevens, Inc., Detroit, Mich.
E. J. Woodison Co., 7415 St. Aubin Ave., Detroit, Mich.

FURNACE LININGS
Campbell-Hausfeld Co., Harrison, O.
Carborundum Co., Niagara Falls, N. Y.
Fisher Furnace Co., Dept. B, 1742 N. Kolmar Ave., Chicago, Ill.
Ramtite Co., 2563 West 18th St., Chicago, Ill.
United States Graphite Co., Saginaw, Mich.

FURNACES (Annealing)
Chicago Flexible Shaft Co., 5600 Roosevelt Rd., Chicago, Ill.
Despatch Oven Co., Minneapolis, Minn.
Gehnrich Corporation, 42-11 35th St., Long Island City, N. Y.
Mahr Manufacturing Co. Div., Diamond Iron Works Inc., Dept. F-10, Minneapolis, Minn.
McCann Furnace Co., 5005 Euclid Ave., Cleveland, O
Vulcan Corporation, 18th & Cherry Sts., Philadelphia, Pa.
Lee Wilson Sales Corp., 1370 Blount St., Cleveland, O.

FURNACES (Crucible Melting)
Ajax Metal Co., Philadelphia, Pa. Philadelphia, Pa.
Campbell-Hausfeld Co., 300-320 Moore St., Harrison, O.
Chicago Flexible Shaft Co., 5600 Roosevelt Rd., Chicago, Ill.
Fisher Furnace Co., Dept. B, 1742 N. Kolmar Ave., Chicago, Ill. Minneapolis, Minn.

FURNACES (Electric Melting)
Ajax Metal Co., Philadelphia, Pa. Philadelphia, Pa.
American Bridge Co., Pittsburgh, Pa.
Detroit Electric Furnace Div. of Kuhlman Electric Co., Bay City, Mich.
Pittsburgh Lectromelt Furnace Corp., Pittsburgh, Pa.
Swindell-Dressler Corp., Pittsburgh, Pa.

FURNACES (Gas or Oil Fired)
Campbell-Hausfeld Co., Harrison, O.
Fisher Furnace Co., 1742 N. Kolmar Ave., Chicago, Ill.
McCann Furnace Co., 5005 Euclid Ave., Cleveland, O.
Vulcan Corporation, 18th & Cherry Sts., Philadelphia, Pa.
Lee Wilson Sales Corp., 1370 Blount St., Cleveland, O.

FURNACES (Heat Treating)
Chicago Flexible Shaft Co., 5600 Roosevelt Rd., Chicago, Ill.
Despatch Oven Co., Minneapolis, Minn.
Mahr Manufacturing Co. Div., Diamond Iron Works Inc., Dept. F-10, Minneapolis, Minn.
McCann Furnace Co., 5005 Euclid Ave., Cleveland, O.
Vulcan Corporation, 18th & Cherry Sts., Philadelphia, Pa.
Lee Wilson Sales Corp., 1370 Blount St., Cleveland, O.

FURNACES (Gray Iron Melting)
American Bridge Co., Pittsburgh, Pa.
Detroit Electric Furnace Div. of Kuhlman Electric Co., Bay City, Mich.
Pittsburgh Lectromelt Furnace Corp., Pittsburgh, Pa.
Swindell-Dressler Corp., Pittsburgh, Pa.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.

FURNACES (Malleable)
Mahr Manufacturing Co. Div., Diamond Iron Works Inc., Dept. F-10, Minneapolis, Minn.

FURNACES (Malleable Annealing)
Chicago Flexible Shaft Co., 5600 Roosevelt Rd., Chicago, Ill.
General Electric Co., Schenectady, N. Y.
McCann Furnace Co., 5005 Euclid Ave., Cleveland, O.
Young Brothers Co., 6508 Mack Ave., Detroit, Mich.

—When writing advertisers, please mention THE FOUNDRY

Now Is The Time...

TO GET THE MOST OUT OF YOUR STEEL ABRASIVES

Now, more than ever, you need production in your air and airless cleaning equipment and it's necessary to use steel abrasives that will enable you to produce the best product in the largest amount.

American Standardized Steel Shot and Eversharp Steel Grit are produced by a uniform method of manufacturing and heat treatment. These processes give such a close check on all raw materials and methods of operation that all steel abrasives produced are uniform. This results in a product that is uniform at all times and thus a product that lasts longer with less wear on the equipment parts.

THE AMERICAN STEEL ABRASIVES COMPANY
GALION OHIO

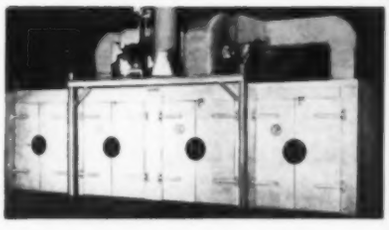
DOUBLE YOUR PRODUCTION — with the fastest and most powerful Rammer made —

NO. 4 DAYTON RING VALVE BENCH RAMMER

Aside from its efficiency, the chief advantage of this Rammer lies in its long life. The Valve Unit will last for years without repair or replacement. The Cylinder Bore and Piston Rod are HARD CHROME PLATED, features which double the life of the Rammer and reduce maintenance costs at least one-half.
Have been adopted as standard by some of the largest users of Rammers throughout the Country. MADE IN FIVE SIZES. Send for Bulletin No. 300.

DAYTON PNEUMATIC TOOL CO., DAYTON, O.

·GAS·OIL·ELECTRIC·
GKS CORE OVENS



No more rejects — No more re-bakes to waste your time and money. GKS Core Baking Ovens assure a uniform bake EVERY time, as well as more economical operation and faster production.

The use of standardized oven parts enables GKS to produce and deliver ovens FASTER and add standard units to increase an oven's capacity to meet all production requirements.

SAVE PRECIOUS TIME AND MONEY

Phone, Wire or Write Your Requirements for Quotation

GEORGE KOCH SONS, INC.
2124 Pennsylvania St. Evansville, Indiana

Aid WAR Production

INSURE SOUND CORE SUPPORT.. Prevent Casting Rejects

Use CLEVELAND CHAPLETS

CLEVELAND FORGED HEAD AND DOUBLE HEAD CHAPLETS ARE VITAL TO FOUNDRIES PRODUCING HEAVY CASTINGS FOR THE MACHINE TOOL INDUSTRY ENGAGED IN BUILDING EQUIPMENT FOR WAR PRODUCTION.

We also manufacture Coil Head Shoulder Radiator Chaplets, Square Head Radiator Chaplets, etc. . . . *Write for Samples.*

CLEVELAND CHAPLET & MFG. CO.
W. 67th St. & N.Y.C. Ry.
CLEVELAND, O.

Chaplets, Since 1890

McLain's System is not an Expense

IT IS AN INVESTMENT!

Foundrymen desirous of helping in DEFENSE WORK must make quality metal and SAVE! SAVE! Every line will be compelled to—begin now on COKE, let us report on your cupola practice which will also enable you to make the BEST SEMI-STEEL using 10 to 50% steel scrap, saving pig iron.

The advice is concise—applicable to all shops, and worth our fee as a desk reference alone. (With each enrollment in February a valuable book on Blueprint Reading FREE) Write today.

McLAIN'S SEMI-STEEL

LIBERTY MOTOR PISTON
15% STEEL

McLAIN'S SYSTEM, INC.
803 Goldsmith Bldg. Milwaukee, Wis.

THE JEFFERSON GYRATORY FOUNDRY RIDDLE . . . . . .

riddles sand faster than one can shovel it into the sieve!

Weighing only 135 lbs., it can be shifted about with ease. Suitable for screening molding and core sands, for medium, fine and coarse dry materials. This riddle mixes while sifting, saving one turn of the sand. Correct gyratory motion eliminates vibration.

We also manufacture turret attachments, Swing Frame Grinders, Belt Sanders and Milling Machines. Let us mail bulletins giving full details.

JEFFERSON MACHINE TOOL CO.
Fourth, Cutter and Sweeney Streets
CINCINNATI, OHIO

WHERE-TO-BUY

FURNACES (Malleable Melting)
American Bridge Co., Pittsburgh, Pa.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.

FURNACES (Nonferrous Melting)
Ajax Metal Co., Philadelphia, Pa. Philadelphia, Pa.
Campbell-Hausfeld Co., 300-320 Moore St., Harrison, O.
Detroit Electric Furnace Div. of Kuhlman Electric Co., Bay City, Mich.
Fisher Furnace Co., Dept. B, 1742 N. Kolmar Ave., Chicago, Ill.
Lee Wilson Sales Corp., 1370 Blount St., Cleveland, O.
Swindell-Dressler Corp., Pittsburgh, Pa.

FURNACES (Powdered Coal)
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

FURNACES (Steel Melting)
American Bridge Co., Pittsburgh, Pa.
Detroit Electric Furnace Div. of Kuhlman Electric Co., Bay City, Mich.
Swindell-Dressler Corp., Pittsburgh, Pa.

FURNACE BLOWERS
Campbell-Hausfeld Co., Harrison, O.
Fisher Furnace Co., Dept. B, 1742 N. Kolmar Ave., Chicago, Ill.
Roots-Connersville Blower Corp., 106 Madison Ave., Connersville, Ind.

GAGES
McKenna Metals Co., 131 Lloyd Ave., Latrobe, Pa.

GAGGERS
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.

GANNISTER
Great Lakes Foundry Sand Co., United Artists Bldg., Detroit, Mich.

GAS (Oxygen, Acetylene, Industrial)
Air Reduction Sales Co., 60 East 42nd St., New York, N. Y.
National Cylinder Gas Co., 205 W. Wacker Drive, Chicago, Ill.

GAS BURNERS
Fisher Furnace Co., 1742 N. Kolmar Ave., Chicago, Ill.
Mahr Mfg. Co., Div., Diamond Iron Wks. Inc., Minneapolis, Minn.
North American Mfg. Co., 2910 E. 75th St., Cleveland, O.

GLOVES (Industrial, Safety)
American Optical Co., Southbridge, Mass.
Pulmosan Safety Equipment Co., 176 Johnson St., Brooklyn, N. Y.

GOGGLES and EYE PROTECTORS
American Optical Co., Southbridge, Mass.
Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh, Pa.
National Cylinder Gas Co., 205 W. Wacker Drive, Chicago, Ill.
Pulmosan Safety Equipment Co., 176 Johnson St., Brooklyn, N. Y.

GRAPHITE
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
J. S. McCormick Co., 25th St. & A.V.R.R., Pittsburgh, Pa.
United States Graphite Co., Saginaw, Mich.

GRINDER CENTERS
McKenna Metals Co., 131 Lloyd Ave., Latrobe, Pa.

GRINDERS (Electric Portable)
Chicago Pneumatic Tool Co., 6 East 44th St., New York.
Stow Mfg. Co., 23 Shear St., Binghamton, N. Y.
U. S. Electrical Tool Co., Cincinnati, O.

GRINDERS (Face)
Diamond Machine Co., 2418 Aramingo St., Philadelphia, Pa.

GRINDERS (Flexible Shaft)
Mall Tool Co., 7720 South Chicago Ave., Chicago, Ill.

GRINDERS (Pneumatic Portable)
Chicago Pneumatic Tool Co., 6 East 44th St., New York.
Cleveland Pneumatic Tool Co., 3734 East 78th St., Cleveland, O.

GRINDERS (Surface, Bench, Disc, Floor)
Delta Mfg. Co., Industrial division, 695 E. Vienna Ave., Milwaukee, Wis.
Fox Grinders, Inc., Oliver Bldg., Pittsburgh, Pa.
Hammond Machinery Builders, 1605 Douglas Ave., Kalamazoo, Mich.
Mall Tool Co., 7720 South Chicago Ave., Chicago, Ill.
Safety Grinding Wheel & Mach. Co., Springfield, Ohio.
Standard Electrical Tool Co., 1942 West 8th St., Cincinnati, O.
U. S. Electrical Tool Co., Cincinnati, O.

GRINDERS (Swing Frame)
Fox Grinders, Inc., Oliver Bldg., Pittsburgh, Pa.
Jefferson Machine Tool Co., Cincinnati, O.
Mall Tool Co., 7720 South Chicago Ave., Chicago, Ill.
Safety Grinding Wheel & Mach. Co., Springfield, Ohio.
Vonnegut Moulder Corp., 1839 Madison Ave., Indianapolis, Ind.

GRINDING MACHINERY
Hammond Machinery Builders, 1605 Douglas Ave., Kalamazoo, Mich.

GRINDING WHEEL DRESSERS
Carborundum Co., Niagara Falls, N. Y.
Desmond-Stephan Mfg. Co., Urbana, O.
Simonds Worden White Co., Dayton, O.
Western Tool & Mfg. Co., Springfield, O.

GRINDING WHEELS—See ABRASIVE WHEELS

GRINDSTONES
Sterling Grinding Wheel Co., Tiffin, O.
Bay State Abrasive Products Co., Westboro, Mass.

GRIT (Abrasive)
Alloy Metal Abrasive Co., 311 W. Huron St., Ann Arbor, Mich.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
American Steel Abrasives Co., Galion, O.
The Carborundum Co., Niagara Falls, N. Y.
Dreisbach Engineering Corp., 45 Warburton Ave., Yonkers, N.Y.
Pangborn Corp., Hagerstown, Md.
Globe Steel Abrasive Co., Mansfield, O.
Pittsburgh Crushed Steel Co., Pittsburgh, Pa.
Simonds Worden White Co., Dayton, O.

HAMMERS (Chipping)
Chicago Mfg. & Distributing Co., 1928 W. 46th St., Chicago, Ill.
Chicago Pneumatic Tool Co., 6 East 44th St., New York
Cleveland Pneumatic Tool Co., 3734 East 78th St., Cleveland, O.

HAMMERS (Rawhide)
Chicago Rawhide Mfg. Co., 1384 Elston Ave., Chicago, Ill.

HAND PADS (Leather)
Chicago Rawhide Mfg. Co., 1384 Elston Ave., Chicago, Ill.

HARDNESS TESTING EQUIPMENT
Harry W. Dietert Co., 9330A Roselawn Ave., Detroit, Mich.

HEAT CONTROL AND RECORDING DEVICES
Foxboro Co., Foxboro, Mass.

HEATERS (Direct Fired)
Despatch Oven Co., Minneapolis, Minn.
McCann Furnace Co., 5005 Euclid Ave., Cleveland, O.

HEATERS (Indirect Fired)
Despatch Oven Co., Minneapolis, Minn.

HEATERS (Gas, Oil, Electric)
Despatch Oven Co., Minneapolis, Minn.

HEATERS (Space, Unit, Oven, Water)
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Despatch Oven Co., Minneapolis, Minn.
McCann Furnace Co., 5005 Euclid Ave., Cleveland, O.
Paul Maehler Co., 2200 W. Lake St., Chicago, Ill.

HEATING EQUIPMENT
McCann Furnace Co., 5005 Euclid Ave., Cleveland, O.

—When writing advertisers, please mention THE FOUNDRY—

60% *faster baking with* PORBECK Drawer-Type (AIR-RECIRCULATING) CORE OVENS

GAS OR OIL FIRED

Fully insulated throughout. Automatic temperature control is variable between 100° and 600° F. Complete safety flame protection. Drawers easily accessible when open—are free running and easy to load. Users praise its low cost of operation. Your inquiry invited.

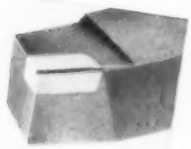
Write for New Bulletin "F"

PORBECK MFG. CO.

2019 N. BROADWAY ST. LOUIS, MO.

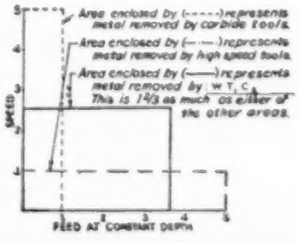
Get the Job Done Faster *with* KENNAMETAL

How heavier feeds reduce machining time on steel parts



STYLE 11 TOOL

The time required for a turning or boring operation is determined just as much by the *feed* as by the *speed* at which the cutting tool is used. Thus a KENNAMETAL tool used at 2-1/2 times the speed and 2/3 the feed of steel tools would remove 2-1/2 x 2/3 or 1-2/3 times as much metal per minute; whereas a weaker carbide tool used even at as much as 5 times the speed and 1/5 the feed of steel tools would show no increase in production (see chart).


Area enclosed by (-----) represents metal removed by carbide tools.
Area enclosed by (— —) represents metal removed by high speed tools.
Area enclosed by (——) represents metal removed by W.T.C.
This is 1/3 as much as either of the other areas.
SPEED
FEED AT CONSTANT DEPTH

RECORD SALES PERMIT PRICE REDUCTION

You need pay no more for using the *best* steel-cutting tools—you can get KENNAMETAL at no extra cost. Write for our new Price List No. 7, effective Jan. 5, 1942. Do you have the KENNAMETAL Catalog No. 42?

McKENNA METALS Co.

131 LLOYD AVENUE, LATROBE, PA.

FOREIGN REPRESENTATIVES: U. S. STEEL EXPORT CO. (Exclusive of Canada, Great Britain and Possessions)

"BRANFORD" PNEUMATIC VIBRATORS

Since 1915

Do Away with Bottlenecks in Your Material Supply Line.

Vibrators for use on Hoppers, Bins, Chutes, Screening Devices, or in any place where bridging over or hanging up of material occurs.

Prevents damage to equipment by sledging. Send specifications on equipment size, sketch if possible, giving approximate weight and nature of material handled.

We will quote promptly.

VIBRATOR FLASK RAPPER

Vibrators and Accessories for all Foundry uses

3/8" Plate Vibrators to 8" Heavy Duty Shakeout Vibrators

We will furnish questionnaire for your specifications on request.

Write for complete Catalog or vibrator information.

NEW HAVEN VIBRATOR CO.

Dept. 5 — 131 Chestnut Street
NEW HAVEN, CONN., U. S. A.

New SAVES MORE THAN ½ FLOOR SPACE

Hammond's streamlined, functionally designed "NO-DUST" GRINDER UNIT requires only 6½ sq. ft. of space, where average grinder with independent dust collector requires almost 15 sq. ft. of today's valuable floor space. Hammond's "NO-DUST" Grinder is available for 10", 12" or 14" wheels . . . has greater mobility . . . sets up anywhere near electrical outlets ready for work.

HAMMOND "NO-DUST" GRINDER

ONE COMPLETE UNIT

WRITE FOR BULLETIN GP-13

Hammond Machinery Builders Inc.

1603 DOUGLAS AVENUE • KALAMAZOO 9, MICHIGAN

EASTERN BRANCH · 71 WEST 23RD STREET, NEW YORK CITY

BERKSHIRE Jolt Squeeze MOLDING MACHINES

Model H Jolt Squeeze

CANNON AIR VIBRATORS

10" SQUEEZE CYLINDER

4" JOLT CYLINDER

CANNON VIBRATOR CO. • 1111 Power Ave. Cleveland, Ohio • **BERKSHIRE MFG. CO.**

THOMAS & PROETZ LUMBER CO.

3405 N. HALL ST. ST. LOUIS, MO.

Manufacturers

CUT TO SIZE CRATING

Southern Hardwoods and Yellow Pine

•

NORTHERN WHITE PINE PATTERN & FLASK LUMBER

•

Carload Shipments from our Northern Yard. LCL from our St. Louis Sheds.

WHERE-TO-BUY

HELMETS (Blasting)
American Optical Co., Southbridge, Mass.
Pangborn Corp., Hagerstown, Md.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.
Pulmosan Safety Equipment Co., 176 Johnson St., Brooklyn, N. Y.

HELMETS (Welding)
American Optical Co., Southbridge, Mass.
National Cylinder Gas Co., 205 W. Wacker Drive, Chicago, Ill.
Pulmosan Safety Equipment Co., 176 Johnson St., Brooklyn, N. Y.

HOISTS (Air)
Chicago Pneumatic Tool Co., 6 East 44th St., New York.
Curtis Pneumatic Machinery Co., 1922 Kienlen Ave., St. Louis, Mo.
Gardner-Denver Co., Gardner Drive, Quincy, Ill.

HOISTS (Chain)
Chicago Tramrail Co., 2910 Carroll Ave., Chicago, Ill.
Cleveland Tramrail Div. of Cleveland Crane & Engineering Co., 1155 East 283rd St., Wickliffe, O.
Modern Equipment Co., Dept. 187, Port Washington, Wis.
Wright Manufacturing Division of American Chain & Cable Co., Inc., York, Pa.

HOISTS (Electric)
American Engineering Co., 2418 Aramingo Ave., Philadelphia, Pa.
Chicago Tramrail Co., 2910 Carroll Ave., Chicago, Ill.
Cleveland Tramrail Div. of Cleveland Crane & Engineering Co., 1155 East 283rd St., Wickliffe, O.
Modern Equipment Co., Dept. 187, Port Washington, Wis.
Shepard-Niles Crane & Hoist Corp., 360 Schuyler Ave., Montour Falls, N. Y.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.
Wright Manufacturing Division of American Chain & Cable Co., Inc., York, Pa.
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh, Pa.
International Molding Machine Co., 2608 W. 16th St., Chicago, Ill.

HOSE (Air, Blasting, Water, Gas)
Cleveland Pneumatic Tool Co., 3734 East 78th St., Cleveland, O.
Gardner-Denver Co., Gardner Drive, Quincy, Ill.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., 77 Townsend St., Passaic, N. J.
Pangborn Corp., Hagerstown, Md.

HYDRAULIC CLEANING EQUIPMENT
Hydro-Blast Corp., 3118 N. Clybourne Ave., Chicago, Ill.
Pangborn Corp., Hagerstown, Md.

ILLUMINATORS (X-Ray Film)
Picker X-Ray Corp., 300 Fourth Ave., New York City.

INGOTS (Nonferrous)
Ajax Metal Co., Philadelphia, Pa.
American Brass Co., 25 Broadway, New York, N. Y.
International Nickel Co. Inc., 67 Wall St., New York City.

IRON CEMENT
Smooth-On Mfg. Co., 570 Communipaw Ave., Jersey City, N. J.

IRON ORE
Bethlehem Steel Co., Bethlehem, Pa.
Pickands, Mather & Co., Cleveland, O.

JACKETS (Mold)
Adams Co., 700 Foster St., Dubuque, Ia.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.

LABORATORY EQUIPMENT (Chemical)
Adolph I. Buehler, 228 N. LaSalle St., Chicago, Ill.
General Electric X-Ray Corp., 2012 Jackson Blvd., Chicago, Ill.
Harry W. Dietert Co., 9330A Roselawn Ave., Detroit, Mich.

LABORATORY EQUIPMENT (Physical)
Adolph I. Buehler, 228 N. LaSalle St., Chicago, Ill.
General Electric X-Ray Corp., 2012 Jackson Blvd., Chicago, Ill.
Harry W. Dietert Co., 9330A Roselawn Ave., Detroit, Mich.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Norton Co., Worcester, Mass.

LADLES
Bethlehem Steel Co., Bethlehem, Pa.
Industrial Equipment Co., Minster, O.
Modern Equipment Co., Dept. 187, Port Washington, Wis.
Frederic B. Stevens, Inc., Detroit, Mich.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

LADLE HEATERS
Hauck Mfg. Co., 106 Tenth St., Brooklyn, N. Y.

LAGGING LUMBER
Dougherty Lumber Co., 4300 E. 68th St., Cleveland, O.

LATHE CENTERS
McKenna Metals Co., 131 Lloyd Ave., Latrobe, Pa.

LEGGINGS
Pulmosan Safety Equipment Co., 176 Johnson St., Brooklyn, N. Y.

LIMESTONE
Bethlehem Steel Co., Bethlehem, Pa.
Dolese & Shepard Co., 111 W. Washington St., Chicago, Ill.

LININGS (Mixer Ladles)
Ramtite Co., 2563 West 18th St., Chicago, Ill.

LINSEED OIL
Hercules Powder Co., 999 Market St., Wilmington, Del.

LOADERS
Clearfield Machine Co., Clearfield, Pa.
National Engineering Co., 549 W. Washington St., Chicago, Ill.

LUBRICANTS (Industrial)
Chicago Mfg. & Distributing Co., 1928 W. 46th St., Chicago, Ill.
United States Graphite Co., Saginaw, Mich.

LUBRICATORS (Air Line)
New Haven Vibrator Co., 131 Chestnut St., New Haven, Conn.

MAGNETS
Dings Magnetic Separator Co., 512 E. Smith St., Milwaukee, Wis.
Fisher Furnace Co., 1742 N. Kolmar Ave., Chicago, Ill.
Stearns Magnetic Mfg. Co., 662 S. 28th St., Milwaukee, Wis.

MALLETS (Rawhide)
Chicago Rawhide Mfg. Co., 1384 Elston Ave., Chicago, Ill.

MANGANESE (Briquets)
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.

MANIFOLDS (Oxy-Acetylene)
National Cylinder Gas Co., 205 W. Wacker Drive, Chicago, Ill.

MATCHPLATES
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.
Plaster Process Castings Co., 6922 Carnegie Ave., Cleveland, O.
Scientific Cast Products Corp., 1388-92 E. 40th St., Cleveland, O.
Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.
Wm. H. Nicholls Co., Richmond Hill, Long Island, N. Y.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.
S P O Incorporated, E. 61st St. and Waterman Ave., Cleveland, O.

MAULS
Chicago Rawhide Mfg. Co., 1384 Elston Ave., Chicago, Ill.

METALLOGRAPHIC EQUIPMENT
Adolph I. Buehler, 228 N. LaSalle St., Chicago, Ill.
General Electric X-Ray Corp., 2012 Jackson Blvd., Chicago, Ill.
Harry W. Dietert Co., 9330A Roselawn Ave., Detroit, Mich.

METALLURGISTS
Chas. C. Kawin Co., 431 So. Dearborn St., Chicago, Ill.

METERS (Gas, Air, Water)
Chas. J. Clark Blast Meter Co., Gladbrook, Iowa.
Illinois Testing Laboratories, Inc., 420 N. LaSalle St., Chicago, Ill.

MICROSCOPES
Adolph I. Buehler, 228 N. LaSalle St., Chicago, Ill.

MILLING MACHINES
Jefferson Machine Tool Co., Cincinnati, Ohio.

MITRE SAW BENCHES
Tannewitz Works, Grand Rapids, Mich.

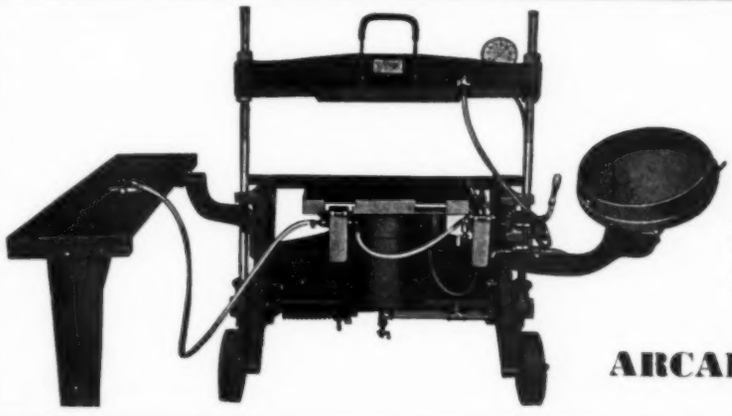
—When writing advertisers, please mention THE FOUNDRY—

"CERTIFIED" FOR WAR WORK!

NOW—more than ever before—Industry has a Herculean job to do! This is no time for trials—for experiments with products that are imitations of the real things! "CERTIFIED" Steel Shot and Steel Grit, the original blast cleaning abrasives are backed by more than fifty years of successful service.

They played an important part in the first World War. Their value to industry—and Uncle Sam—in this war is inestimable! For maximum Airless or Air Blast Cleaning production—demand the best—get "CERTIFIED"!

PITTSBURGH CRUSHED STEEL CO.
PITTSBURGH, PENNA.
STEEL SHOT AND GRIT CO.
BOSTON, MASS.



DEPENDABLE JOLT SQUEEZERS

	No. 81	No. 91	No. 101
Jolt Cyl.	3"	4"	5"
Squeeze Cyl.	8½"	10"	13"
Between Uprights	32"	36"	38"

ARCADE MANUFACTURING CO.
Freeport, Illinois

LAWCO BOND

Highly refractory, remarkable bond strength—the fewest words you can use to describe LAWCO BOND. The clay we use is processed to meet every steel, grey iron and malleable plant requirement. We don't make fancy claims—we just sell a practical clay bond for practical foundrymen. A sales representative in each principal city. . . . . .

THE LAWRENCE CLAY COMPANY
JACKSON, OHIO

One Week to 10 Days

IMMEDIATE DELIVERY

General Centrifugal Blowers

Designed for GAS *and* OIL BURNERS, CORE *and* ANNEALING OVENS, CUPOLAS *and* CRUCIBLE FURNACES

★

Gas Boosters

★

Cupola Blowers

WIDE RANGE OF SIZES FOR EVERY REQUIREMENT

★

Send for NEW 8-Page Bulletin CB-101

GENERAL BLOWER COMPANY

406 N. PEORIA ST.—MONROE 0244—CHICAGO, ILL.

120 Liberty St., New York, N. Y. — 933 East Jefferson St., Detroit, Michigan — 3502 Berkeley Rd., Cleveland Heights, O.

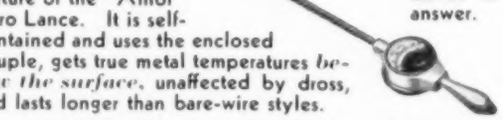
430 Frick Bldg., Pittsburgh, Pa. — P. O. Box 5010, Fox Chase, Phila., Pa.

1726 E. Washington Blvd.—PRospect 9540—Los Angeles, Calif.

NON-FERROUS FOUNDRYMEN AGREE . . .

A Reliable Pyrometer is Indispensable

For sound non-ferrous castings . . . and for lower costs . . . you must have a reliable pyrometer . . . one that gives accurate readings yet one that will stand up under hard usage on the pouring floor and in the furnace room. The "Alnor" Pyro Lance is the answer.



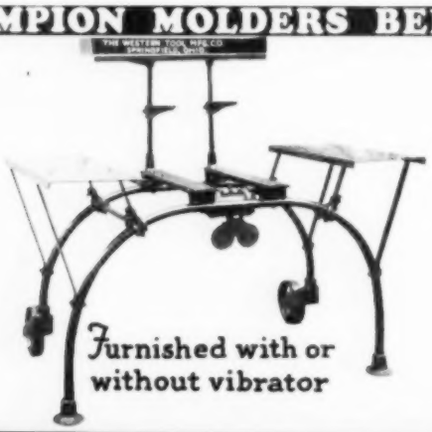
Shock-Resisting Movement is a feature of the "Alnor" Pyro Lance. It is self-contained and uses the enclosed couple, gets true metal temperatures *below the surface*, unaffected by dross, and lasts longer than bare-wire styles.

Send for illustrated bulletin and prices.

ILLINOIS TESTING LABORATORIES, INC.

418 N. La Salle St. — Chicago, Ill.

CHAMPION MOLDERS BENCH



Furnished with or without vibrator

THE WESTEAN TOOL & MFG. CO., SPRINGFIELD, OHIO

WHERE-TO-BUY

MIXERS (Core Wash)
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.

MIXERS (Sand and Clay)
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Clearfield Machine Co., Clearfield, Pa.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Royer Foundry & Machine Co., Kingston, Pa.

MOLD CONVEYORS
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.

MOLD DRYERS
Hauck Mfg. Co., 106 Tenth St., Brooklyn, N. Y.

MOLD OVENS and DRYERS
Carl-Mayer Corp., 3030 Euclid Ave., Cleveland, O.
Despatch Oven Co., Minneapolis, Minn.
Foundry Equipment Co., Cleveland, O.
Gehnrich Corporation, 42-11 35th St., Long Island City, N. Y.
George Koch Sons, Inc., 2124 W. Pennsylvania St., Evansville, Ind.
McCann Furnace Co., 5005 Euclid Ave., Cleveland, O.
Paul Maehler Co., 2200 W. Lake St., Chicago, Ill.
Lanly Company, 750 Prospect Ave., Cleveland, O.
Porbeck Mfg. Co., 2019 N. Broadway, St. Louis, Mo.
Young Brothers Co., 6508 Mack Ave., Detroit, Mich.

MOLDERS BENCHES
Western Tool & Mfg. Co., Springfield, O.

MOLDERS SHOES
Lehigh Safety Shoe Co., Allentown, Pa.

MOLDING MACHINES
Arcade Manufacturing Co., Freeport, Ill.
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Berkshire Mfg. Co., 1111 Power Ave., Cleveland, O.
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.
Davenport Machine & Foundry Co., Davenport, Iowa
Haynes Foundry Equipment Co., 1734 Lake St., Kalamazoo, Mich.
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh, Pa.
International Molding Machine Co., 2608 W. 16th St., Chicago, Ill.
Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.
Moline Iron Works, 228 Second St., Moline, Ill.
Wm. H. Nicholls Co., Richmond Hill, Long Island, N. Y.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.
Pioneer Mfg. Co., West Allis, Wis.
S P O Incorporated, E. 61st St. and Waterman Ave., Cleveland, O.
Steeb Pattern Co., Quincy, Ill.
Tabor Mfg. Co., 6225 Tacony St., Philadelphia, Pa.

MOLDING MACHINES (Jolt)
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.
Davenport Machine & Foundry Co., Davenport, Iowa
Haynes Foundry Equipment Co., 1734 Lake St., Kalamazoo, Mich.

MOLDING MACHINES (Rollover)
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.
Davenport Machine & Foundry Co., Davenport, Iowa
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh, Pa.
International Molding Machine Co., 2608 W. 16th St., Chicago, Ill.
Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.
Wm. H. Nicholls Co., Richmond Hill, Long Island, N. Y.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.
S P O Incorporated, E. 61st St. and Waterman Ave., Cleveland, O.

MOLDING MACHINES (Squeeze)
Adams Company, 700 Foster St., Dubuque, Iowa.
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill. Quincy, Ill.
Davenport Machine & Foundry Co., Davenport, Iowa
Haynes Foundry Equipment Co., 1734 Lake St., Kalamazoo, Mich.
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh, Pa.
International Molding Machine Co., 2608 W. 16th St., Chicago, Ill.
Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.
Moline Iron Works, 228 Second St., Moline, Ill.
Wm. H. Nicholls Co., Richmond Hill, Long Island, N. Y.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.
S P O Incorporated, E. 61st St. and Waterman Ave., Cleveland, O. Quincy, Ill.
Steeb Pattern Co., Quincy, Ill.

MOLDING SANDS
Great Lakes Foundry Sand Co., United Artists Bldg., Detroit, Mich.
Hougland & Hardy Inc., Evansville, Ind.
Midwest Foundry Supply Co., Edwardsville, Ill.
Ottawa Silica Co., Ottawa, Ill.

MOLD WASH
Dayton Oil Co., Dayton, O.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Hougland & Hardy Inc., Evansville, Ind.
Pollard Oil Products Co., 1627 So. 44th St., Milwaukee, Wis.
Refractory Mica Products Inc., 500 Chancellor Ave., Irvington, N. J.
United States Graphite Co., Saginaw, Mich.

MOLYBDENUM
Molybdenum Corporation of America, Pittsburgh, Pa.

MONORAIL SYSTEMS
American Monorail Co., 13104 Athens Ave., Cleveland, O.
Chicago Tramrail Co., 2910 Carroll Ave., Chicago, Ill.
Cleveland Tramrail Div. of Cleveland Crane & Engineering Co., 1155 East 283rd St., Wickliffe, O.
Modern Equipment Co., Dept. 187, Port Washington, Wis.

NAILS (Chill)
Bethlehem Steel Co., Bethlehem, Pa.
Republic Steel Corp., Cleveland, O.

NICKEL
International Nickel Co. Inc., 67 Wall St., New York City.

NOZZLES (Blasting)
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Davenport Machine & Foundry Co., Davenport, Iowa
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Great Lakes Foundry Sand Co., United Artists Bldg., Detroit, Mich.
Norton Co., Worcester, Mass.
Pangborn Corp., Hagerstown, Md.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

OIL BURNERS
Fisher Furnace Co., 1742 N. Kolmar Ave., Chicago, Ill.
North American Mfg. Co., 2910 E. 75th St., Cleveland, O.

OPTICAL PYROMETERS
Adolph I. Buehler, 228 N. LaSalle St., Chicago, Ill.

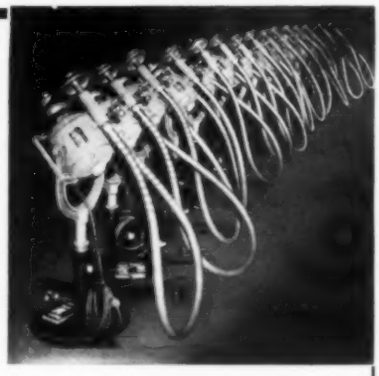
OVENS (Annealing and Heat Treating)
Despatch Oven Co., Minneapolis, Minn.
Foundry Equipment Co., Cleveland, O.
Gehnrich Corporation, 42-11 35th St., Long Island City, N. Y.
Mahr Mfg. Co., Div. of Diamond Iron Works Inc., Dept. F8, Minneapolis, Minn.
McCann Furnace Co., 5005 Euclid Ave., Cleveland, O
Paul Maehler Co., 2200 W. Lake St., Chicago, Ill.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.
Young Brothers Co., 6508 Mack Ave., Detroit, Mich.

—When writing advertisers please mention THE FOUNDRY—

Whatever the job . . .

STOW FLEXIBLE SHAFT MACHINES

Give you the Right Tool at the Right Speed!



Like a hundred tools in one, Stow Flexible Shaft Machines with Hi-Lo Pulley are "the one best tool" for jobs ranging from rough-finishing to delicate, precision grinding.

Hi-Lo permits quick selection of any desired tool speed within range of the pulleys. Simple, dependable—it works by means of an adjustable pitch diameter on the drive shaft pulley. Usually the variation between maximum and minimum pitch diameters is in ratio of 2 to 1. Speed controllable within a few revolutions.

These Stow units are not only highly adaptable production tools—but machines for the tool room, useful for intricate precision work. And Stow's 66 years of flexible shaft experience is your guarantee of soundly-designed, long-wearing machines. Write today for further details and new Stow catalog.

STOW MANUFACTURING CO., INC.
23 SHEAR STREET BINGHAMTON, N. Y.
Inventors of the Flexible Shaft

FOR GRAY IRON FOUNDRIES

Gray Cast Iron

By John W. Bolton

A COMPLETE DISCUSSION IN ONE VOLUME ON THE SUBJECT OF GRAY CAST IRON

■ Presents the basic metallurgical principles involved in the manufacture of gray iron to modern engineering specifications.

Its 22 chapters discuss such phases as melting processes, casting defects, design, effects of regular and alloying elements, superheating, heat treatment, physical properties, machinability and wear, effect of temperature on mechanical properties, corrosion, and specifications.

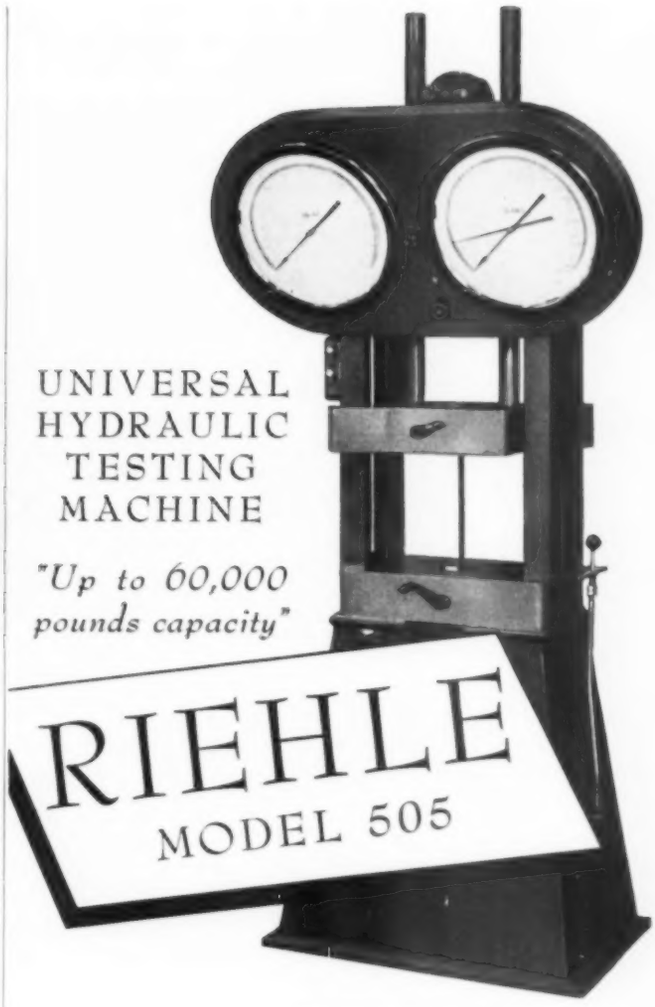
383 Pages, 262 Illustrations, Diagrams, Charts & Tables

PRICE, POSTPAID $5.00

THE PENTON PUBLISHING CO.
Book Department
Penton Building **Cleveland, Ohio**
301F

UNIVERSAL HYDRAULIC TESTING MACHINE

"Up to 60,000 pounds capacity"



RIEHLE
MODEL 505

★ *Model 505 is the most accurate and reliable machine in the low priced bracket today.*
★ Rubber mounted dial panel with inclination adjustable to suit the height of the operator in a sitting or standing position.
★ Extensometer—specimen—load indicator and speed control scale can be observed by one operator without changing position.
★ Two motor drives—one for hydraulic loading and a second one for fast vertical adjustment of gripping head and table.
★ Spherically suspended gripping head and table assuring consistent accuracy even with loads applied off-center.
★ Highest quality, high pressure piston pump for lifetime service and accurate speed control.
★ Testing speeds marked on large scale in inches per minute.
★ Capacities available include 10,000, 20,000, 30,000, 40,000 and 60,000 lbs. Popular sizes 40,000 and 60,000 lbs. are stocked to enable *delivery on short notice.*

RIEHLE TESTING MACHINES
Division of American Machine and Metals, Inc.
East Moline, Ill.

ONE TEST IS WORTH A THOUSAND EXPERT OPINIONS

FILL IN — MAIL AT ONCE!

RIEHLE TESTING MACHINE DIVISION F2-42
East Moline, Ill.

YES! Without obligation send me DETAILS on Riehle Universal Hydraulic Testing Machines. Also literature on Riehle Impact Tester.

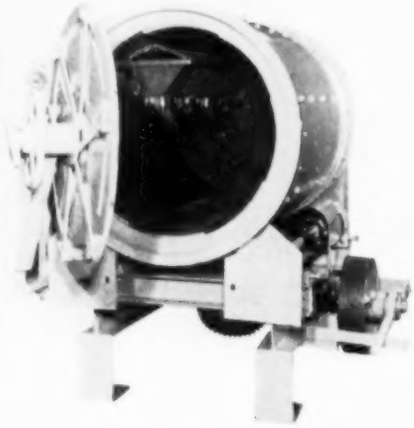
Name _____
Address _____ State _____
City _____

AIR BLAST SAND-GRIT-SHOT

Positive Control For Required Surface

NEW ALL STEEL BARREL WITH EXHAUST PULLING THROUGH DOOR AND BARREL

Removing All Dust



Greater Production

Lower Up-Keep

Complete Unit Abrasive Automatically Returned to Nozzles All Within The Barrel

New Positive Alignment of Air And Blast Nozzle

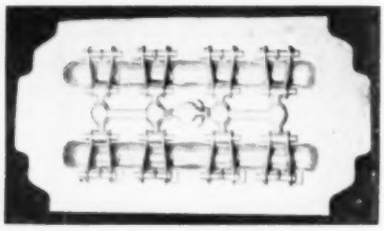
Belt or Direct Gearmotor Drive

1500 MACHINES OF THIS TYPE
HAVE CLEANED MILLIONS OF TONS OF CASTINGS, FORGINGS, AND HEAT TREATED PARTS—

Write Today For Bulletin "SW"

DREISBACH ENGINEERING CORPORATION

45 Warburton Ave. Yonkers, N. Y.



Quality Precision Pressure-Cast Plates
Cope and Drag Plates · Multiple Core Boxes

MANY YEARS EXPERIENCE IN THIS FIELD

Ask for List of Satisfied Customers—Write for Details

PLASTER PROCESS CASTINGS CO.

6922 Carnegie Ave.—Cleveland, O.

ENORMOUS CAPACITY AND LOW MAINTENANCE COST

The Comb's type "V" 100-lb. Gyratory riddle does the work of ten men at an operating cost of about 1 penny an hour. It may be carried easily by one man, is 5' over all, and greatly reduces riddling costs. Take advantage of our 30 day free trial offer—we pay the freight. Comb's Gyratory riddles are available in four types and sizes—write for our catalog, and select your type.

GREAT WESTERN MFG. CO.

LEAVENWORTH, KANSAS

WHERE-TO-BUY

OVENS (Core)
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.
The Carl-Mayer Corp., 3030 Euclid Ave., Cleveland, O.
Despatch Oven Co., Minneapolis, Minn.
Foundry Equipment Co., Cleveland, O.
Gehnrich Corporation, 42-11 35th St., Long Island City, N. Y.
George Koch Sons, Inc., 2124 W. Pennsylvania St., Evansville, Ind.
Lanly Company, 750 Prospect Ave., Cleveland, O.
McCann Furnace Co., 5005 Euclid Ave., Cleveland, O.
Paul Maehler Co., 2200 W. Lake St., Chicago, Ill.
Porbeck Mfg. Co., 2019 N. Broadway, St. Louis, Mo.
Vulcan Corporation, 18th & Cherry Sts., Philadelphia, Pa.
Young Brothers Co., 6508 Mack Ave., Detroit, Mich.

OVENS (Enameling, Japanning)
Carl-Mayer Corp., 3030 Euclid Ave., Cleveland, O.
Despatch Oven Co., Minneapolis, Minn.
Gehnrich Corporation, 42-11 35th St., Long Island City, N. Y.
George Koch Sons, Inc., 2124 W. Pennsylvania St., Evansville, Ind.
McCann Furnace Co., 5005 Euclid Ave., Cleveland, O.
Paul Maehler Co., 2200 W. Lake St., Chicago, Ill.
Porbeck Mfg. Co., 2019 N. Broadway, St. Louis, Mo.
Young Brothers Co., 6508 Mack Ave., Detroit, Mich.

OVENS (Mold)
Despatch Oven Co., Minneapolis, Minn.

OXYGEN
Air Reduction Sales Co., 60 East 42nd St., New York, N. Y.
National Cylinder Gas Co., 205 W. Wacker Drive, Chicago, Ill.

PARTING COMPOUNDS
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Midwest Foundry Supply Co., Edwardsville, Ill.
Smith Facing & Supply Co., 1857 Carter Rd., Cleveland, O.
Frederic B. Stevens, Inc., Detroit, Mich.

PATTERN COMPOUND
American Foundry Equipment Co., 505 S. Byrkit St. Mishawaka, Ind
Tamms Silica Co., 228 N. LaSalle St., Chicago, Ill.

PATTERN LUMBER
Dougherty Lumber Co., Cleveland, O.
Reitz Lumber Co., 1800 N. Central Park Ave., Chicago, Ill.
Thomas & Proetz Lumber Co., 3400 N. Hall St., St. Louis, Mo.

PATTERN PLATES
Marathon Chemical Co., Div., Marathon Paper Mills Co., Rothschild, Wis.
Plaster Process Castings Co., 6922 Carnegie Ave., Cleveland, O.
Scientific Cast Products Corp., 1388-92 E. 40th St., Cleveland, O.

PATTERN PLATE STOCK
Marathon Chemical Co., Div., Marathon Paper Mills Co., Rothschild, Wis.

PATTERN SHOP EQUIPMENT
Delta Mfg. Co., Industrial division, 695 E. Vienna Ave., Milwaukee, Wis.
Oliver Machinery Company, Grand Rapids, Mich.

PATTERNS (Electro Copper)
Electro-Chemical Pattern & Mfg. Co., 3975 Beaufait, Detroit, Mich.

PATTERNS (Wood, Metal)
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.
Electro-Chemical Pattern & Mfg. Co., 3975 Beaufait, Detroit, Mich.
S P O Incorporated, E. 61st St. and Waterman Ave., Cleveland, O.

PHOTOGRAPHIC EQUIPMENT
General Electric X-Ray Corp., 2012 Jackson Blvd., Chicago, Ill

PIG IRON
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie-Illinois Steel Corp., Pittsburgh, Pa.
E. & G. Brooke Iron Co., Birdsboro, Pa.
Hanna Furnace Co., Div. of National Steel Corp., Ecorse, Detroit, Mich.
Hickman-Williams & Co., Cleveland, O.
Pickands, Mather & Co., Cleveland, O.
Republic Steel Corporation, Cleveland, O.
Woodward Iron Co., Woodward, Ala.

PIG IRON (Silvery)
Bethlehem Steel Co., Bethlehem, Pa.
Jackson Iron & Steel Co., Jackson, O.

PINS (Flask)
Sterling Wheelbarrow Co., 7100 W. Walker St., Milwaukee, Wis.
Truscon Steel Co., 6100 Truscon Ave., Cleveland, O.

PISTON RINGS (for Molding Machines, Compressors, etc.)
Wm. H. Nicholls Co., Richmond Hill, Long Island, N. Y.

PLATES (Bottom)
Sterling Wheelbarrow Co., 7100 W. Walker St., Milwaukee, Wis.

PLATES (Core Drying)
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.
Johns-Manville, 22 East 40th St., New York City.

PLUMBAGO
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
J. S. McCormick Co., 25th St. & A.V.R.R., Pittsburgh, Pa.
Frederic B. Stevens, Inc., Detroit, Mich.
United States Graphite Co., Saginaw, Mich.

PNEUMATIC TOOLS
Chicago Pneumatic Tool Co., 6 East 44th St., New York
Cleveland Pneumatic Tool Co., 3734 East 78th St., Cleveland, O.
Dayton Pneumatic Tool Co., Dayton, O.
Gardner-Denver Co., Gardner Drive, Quincy, Ill.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.

POLISHING MACHINERY
Standard Electrical Tool Co., 1942 West 8th St., Cincinnati, O.
Hammond Machinery Builders, 1605 Douglas Ave., Kalamazoo, Mich.

POURING DEVICES
Modern Equipment Co., Dept. 187, Port Washington, Wis.

POWDERED COAL EQUIPMENT
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

PROTECTIVE MATERIALS (X-Ray)
Picker X-Ray Corp., 300 Fourth Ave., New York City.

PULLEYS (Magnetic)
Dings Magnetic Separator Co., 512 E. Smith St., Milwaukee, Wis.
Stearns Magnetic Mfg. Co., 662 S. 28th St., Milwaukee, Wis.

PUMPS
Gardner-Denver Co., Gardner Drive, Quincy, Ill.

PUMPS (Dry, Vacuum)
Fuller Company, Catasaqua, Pa.

PUSH-OFF MACHINES
Champion Foundry & Machine Co., 1314 West 21st St., Chicago, Ill
International Molding Machine Co., 2608 W. 16th St., Chicago, Ill.
Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.

PYROMETERS
Harry W. Dietert Co., 9330A Roselawn Ave., Detroit, Mich.
Illinois Testing Laboratories, Inc., 420 N. LaSalle St., Chicago, Ill
Tamms Silica Co., 228 N. LaSalle St., Chicago, Ill.

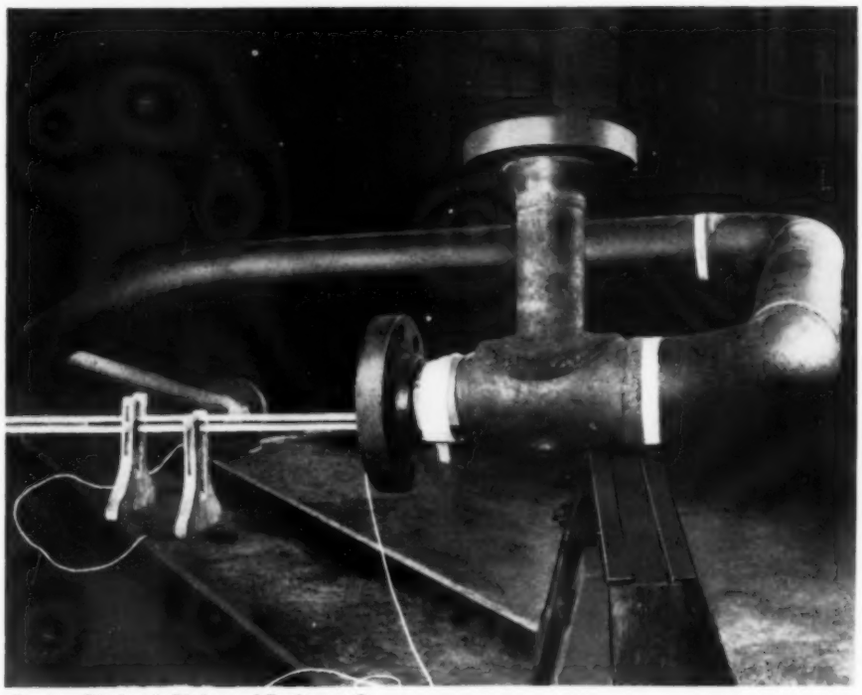
RADIOGRAPHY (Industrial)
Radium Chemical Co. Inc., 570 Lexington Ave., New York, N. Y.

RADIUM
Radium Chemical Co. Inc., 570 Lexington Ave., New York, N. Y.

REFRACTORIES
Carborundum Co., Niagara Falls, N. Y.
Eastern Clay Products, Inc., Eifort, O.
Fisher Furnace Co., 1742 N. Kolmar Ave., Chicago, Ill.
Haws Refractories Co., Johnstown, Pa.
Norton Co., Worcester, Mass.
Ramtite Co., 2563 West 18th St., Chicago, Ill.

—When writing advertisers, please mention THE FOUNDRY—

RADIUM *for* INDUSTRIAL RADIOGRAPHY



Courtesy Pittsburgh Piping and Equipment Co.

The illustration shows radium being used to take a radium-radiograph of a weld. Placing the radium centrally in the pipe and the film on the outside permits of taking a radiograph of the entire circumferential weld with one exposure. This is just one of the many advantages of the use of radium for industrial radiography.

RADIUM MAY BE PURCHASED OR RENTED BY THE DAY, MONTH OR YEAR.

WRITE FOR DETAILS

Pioneers in the Use of Radium for Industrial Radiography

RADIUM CHEMICAL COMPANY, INC. · **570 Lexington Ave., N. Y.** · **Chicago: Marshall Field Annex Bldg.**

COULAC

(POWDER)

GLUTRIN

(LIQUID)

WRITE TODAY for booklets containing *practical* information regarding the use of these two

OUTSTANDING SAND BINDERS

ROBESON PROCESS COMPANY
AMERICAN GUM PRODUCTS COMPANY

General Offices:

500 Fifth Ave., New York City

STEEL BOTTOM AND CORE PLATES

NOT AFFECTED BY HEAT
NON-WARPABLE, AND

GUARANTEED

PERFECTLY STRAIGHT AND LEVEL UNDER ANY CONDITION—CORRECTLY REINFORCED

• There is an individual plate for every class of work. We devote our attention to individual cases, and have designed a plate to meet every requirement.

Specify Wadsworth Plates for permanent trueness and better castings.

CORE ROOM EQUIPMENT

- Core Making Machines
- Core Cutting Off and Coning Machines

Write for complete catalog of Core Making Machines and Equipment

THE WADSWORTH CORE MACHINE & EQUIPMENT CO.
AKRON, OHIO, U.S.A.

Perfectly screened molding sand... Always!

■ Webster says that a riddle is a problem but "BUFFALO" Riddles are no problem—they are the answer to the problem of better castings.

Uniform mesh, evenly covered with an extra heavy coating of spelter—uniform opening of mesh, all mean a better screening job for that vital part of your process.

Just ask a molder: He'll tell you a good riddle is a necessity for high grade castings. "BUFFALO" Riddles come in three grades, three sizes and seven different meshes.

Plain Riddle Bottoms for your machine are available too. Just write for Folder No. 591-B.

BUFFALO WIRE WORKS COMPANY

425 TERRACE, BUFFALO, N. Y.

Branch Office & Warehouse: 11 South 7th Street, Philadelphia, Pa.

WILLIAMS *Buckets*

HOOK ON "SINGLE-LINE"

Special Type for

FOUNDRY SERVICE

¾ to 1¼ cu. yd. cap.

THE WELLMAN ENGINEERING CO.

7019 Central Ave. Cleveland, Ohio

***built by* WELLMAN**

SAFETY

(Reg. Trade Mark)

BOX TYPE HOLDER

For Serial Numbering

- More Safety!
- More Service!
- More Efficiency!

Box levels holder, thereby assuring more even impressions. Made for marking Flats, Squares, Rounds, and Shapes. Safety Steel construction eliminates spalling and mushrooming.

Write for Literature

M. E. CUNNINGHAM CO.

97 E. Carson Street Pittsburgh, Pa.

WHERE-TO-BUY

REFRACTORIES—Cont'd.
Chas. Taylor Sons Co., P. O. Box 58, Annex Sta., Cincinnati, Ohio.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
United States Graphite Co., Saginaw, Mich.

REPAIR PARTS (Molding Machine)
Pioneer Mfg. Co., West Allis, Wis.

RESPIRATORS
Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh, Pa.
Pulmosan Safety Equipment Co., 176 Johnson St., Brooklyn, N. Y.

RIDDLES
Buffalo Wire Works, 425 Terrace, Buffalo, N. Y.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.

RIDDLES (Electric)
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland O.
Foundry Supplies & Mfg. Co., 2221 Orchard St., Chicago, Ill.
Great Western Mfg. Co., Leavenworth, Kans.
Jefferson Machine Tool Co., Cincinnati, O.

RIDDLES (Hand)
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Seymour & Peck Co., P. O. Box 5609, Chicago, Ill.

RIDDLE BOTTOMS (Gyratory)
Buffalo Wire Works Co., 425 Terrace, Buffalo, N. Y.
Seymour & Peck Co., P. O. Box 5609, Chicago, Ill.

RODS (Steel)
Republic Steel Corp., Cleveland, O.

ROD STRAIGHTENER
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.

ROLLER-HEARTH FURNACES (Electric Annealing)
General Electric Co., Schenectady, N. Y.

RUBBER LINING MATERIAL (Abrasive Resisting)
Pangborn Corp., Hagerstown, Md.

SAFETY CLOTHING
American Optical Co., Southbridge, Mass.
Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh, Pa.
Pulmosan Safety Equipment Co., 176 Johnson St., Brooklyn, N. Y.

SALT and SALT TABLETS
Fairway Laboratories, 1530 Hadley St., St. Louis, Mo.
Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh, Pa.
Morton Salt Co., 208 W. Washington St., Chicago, Ill.

SANDS (Core, Molding, Blasting)
Great Lakes Foundry Sand Co., United Artists Bldg., Detroit, Mich.
Hougland & Hardy Inc., Evansville, Ind.
Midwest Foundry Supply Co., Edwardsville, Ill.
Ottawa Silica Co., Ottawa, Ill.
Pangborn Corp., Hagerstown, Md.
Producers Core Sand Corp., Michigan City, Ind.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

SAND BLAST BARRELS
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Dreisbach Engineering Corp., 45 Warburton Ave., Yonkers, N.Y.
Houghland & Hardy, Inc., Evansville, Ind.
Pangborn Corp., Hagerstown, Md.
Parsons Engineering Co., Cleveland, O.
Tabor Mfg. Co., 6225 Tacony St., Philadelphia, Pa.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

SAND BLAST CABINETS
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Pangborn Corp., Hagerstown, Md.

SAND BLAST EQUIPMENT
American Air Filter Co., 262 Central Ave., Louisville, Ky.
The American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Pangborn Corp., Hagerstown, Md.
Parsons Engineering Co., Cleveland, O.
Ruemelin Mfg. Co., 3850 North Palmer St., Milwaukee, Wis.
Tabor Mfg. Co., 6225 Tacony St., Philadelphia, Pa.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

SAND BLAST NOZZLES
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Norton Company, Worcester, Mass.
Pangborn Corp., Hagerstown, Md.
Ruemelin Mfg. Co., 3850 N. Palmer St., Milwaukee, Wis.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

SAND BLAST ROOMS
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Hydro-Blast Corp., 3118 N. Clybourne Ave., Chicago, Ill.
Pangborn Corp., Hagerstown, Md.
Parsons Engineering Co., Cleveland, O.
Ruemelin Mfg. Co., 3850 North Palmer St., Milwaukee, Wis.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

SAND BLAST TABLES
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Pangborn Corp., Hagerstown, Md.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

SAND CONTROL and TESTING EQUIPMENT
Harry W. Dietert Co., 9330A Roselawn Ave., Detroit, Mich.
National Engineering Co., 549 W. Washington St., Chicago, Ill.

SAND CONVEYING and HANDLING EQUIPMENT
Ajax Flexible Coupling Co., Westfield, N. Y.
American Air Filter Co., 262 Central Ave., Louisville, Ky.
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Clearfield Machine Co., Clearfield, Pa.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Modern Equipment Co., Dept. 187, Port Washington, Wis.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.
Robins Conveying Belt Co., Passaic, N. J.
Royer Foundry & Machine Co., Kingston, Pa.

SAND CONVEYING and HANDLING EQUIPMENT (Pneumatic)
Fuller Company, Catasaqua, Pa.

SAND DRYERS
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Pangborn Corp., Hagerstown, Md.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.

SAND MEASURING and WEIGHING DEVICES
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
National Engineering Co., 549 W. Washington St., Chicago, Ill.

SAND MIXERS
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Clearfield Machine Co., Clearfield, Pa.
Link Belt Co., Chicago, Ill.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Royer Foundry & Machine Co., Kingston, Pa.

SAND PREPARATION EQUIPMENT
Ajax Flexible Coupling Co., Westfield, N. Y.
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Clearfield Machine Co., Clearfield, Pa.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.

—When writing advertisers, please mention THE FOUNDRY*—*

SAND CONTROL

Moisture Teller — *Sand Rammer* — *Permeability Meter* — *Strength Machine*

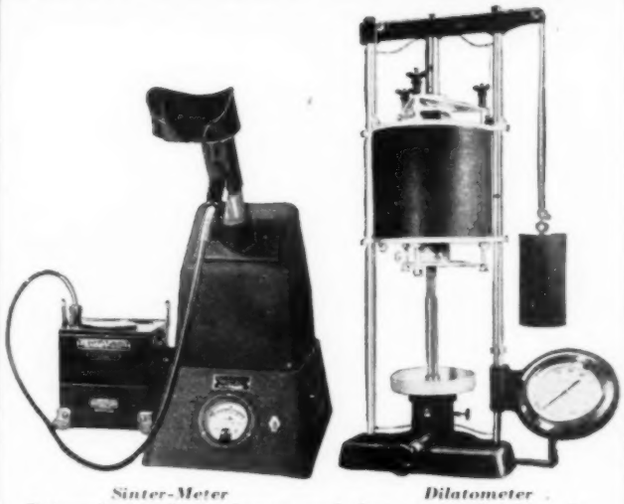
Measure the moisture, permeability, green strength, deformation and dry strength of molding sands.

SAND LABORATORY

Test Work Solicited

Molding Sands—Core Sands—Silica Sands
Core Oils—Core Binders—Bonding Clays.
Foundry Sand Consulting Service.

HIGH TEMPERATURE



Sinter-Meter — *Dilatometer*

Determine refractoriness and hot strength, hot deformation, collapsibility, expansion and contraction of sands and cores. A practical test that pays.

MODERN ANALYSIS

Carbon Determinator

Use cast specimens for carbon and sulphur determinations and save time. This is made practical with our specimen mold.

Accurate carbon determinations made in two minutes with the Carbon Determinator.

Accurate sulphur determinations made in three minutes with the Sulphur Determinator.

Accurate spectrographic analysis of metals in eight minutes.

Write to

HARRY W. DIETERT CO.
9330A Roselawn Ave.
DETROIT, MICH.

Use CURTIS AIR HOISTS

to Speed Heavy Lifting Jobs —Reduce Worker Fatigue —Release Needed Workers

Shown above is an installation of a Curtis "One-Man" Air Hoist used at the loading-end of a cleaner in a malleable foundry. The mill was built by N. Ranshoff, Inc., Cincinnati.

This is but one example of how Curtis Air Hoists perform heavy lifting jobs quickly, easily, and accurately. They reduce worker fatigue, release men for other jobs—particularly important now in these days of skilled labor shortages. In plants throughout the country, Curtis Air Hoists have solved many a tough production and personnel problem.

In the face of urgent demands for increased production today, it will pay you to consider these advantages of Curtis All Steel Air Hoists:

- **Low first cost—low operating expense**
- **Smooth, fast, accurate control of loads**
- **Light weight, pendant, bracketed, or rope compounded types**
- **Immunity to abuse or overloading**
- **Fewer interruptions for servicing**
- **One man operation — by ordinary labor**

For complete information as to how you can step up production and lower costs in *your* plant, send for free booklet, "How Air Is Being Used in Your Industry"—mail the coupon today.

CURTIS

ST. LOUIS • NEW YORK • CHICAGO • SAN FRANCISCO
PORTLAND

CURTIS PNEUMATIC MACHINERY DIVISION
OF CURTIS MANUFACTURING COMPANY
1922 Kienlen Avenue, St. Louis, Mo.

Please send me free booklet C-60, also information on Curtis Air Hoists.

Name.....

Address.....

City.....State.....

POWER
+
SAFETY
+
FLEXIBILITY
+
EASY
OPERATION

OLIVER NO. 51

SPEED LATHE

The motor itself forms the headstock of this lathe, and *any* or *all* speeds, from 600 to 3600 r.p.m. are readily obtained by turning convenient hand wheel. We believe, and our customers agree with us, that this is the most efficient, reliable and safest speed lathe obtainable. Its popularity with pattern makers is its chief recommendation. Write for prices and specifications.

Oliver Machinery Company
Grand Rapids, Michigan, U.S.A.
HIGH GRADE MACHINERY

POLLY BRAND
"Speaks for itself"

ALL OUT FOR DEFENSE
POLLY
HI-TEMP COTE
CORE WASH is used by many leading foundries. Will decrease your cleaning room costs.
Write for full information—Folders and Samples

POLLARD
OIL PRODUCTS COMPANY
1627 SOUTH 44th ST. MILWAUKEE, WIS.

for ACCURATE casting duplication

Single or Multiple Section Matchplates from Single Master Pattern.
Cast under Pressure in Plaster Molds.
Cope and Drag Plates.
Multiple Core Boxes.
Precision Castings.

SCIENTIFIC · MATCH PLATES · Pressure Cast

The SCIENTIFIC CAST PRODUCTS Corp.
1388-1392 E. 40th St., CLEVELAND, O.
505-521 S. Western Ave., CHICAGO, ILL.

WHERE-TO-BUY

SAND PREPARATION EQUIPMENT (Cont'd.)
Royer Foundry & Machine Co., Kingston, Pa.
Simplicity Engineering Co., Durand, Mich.

SAND RAMMERS
Chicago Pneumatic Tool Co., 6 East 44th St., New York.
Cleveland Pneumatic Tool Co., 3734 East 78th St., Cleveland, O.
Dayton Pneumatic Tool Co., Dayton, O.
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh, Pa.

SAND RECLAIMERS
Hydro-Blast Corp., 3118 N. Clybourne Ave., Chicago, Ill.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Stearns Magnetic Mfg. Co., 662 S. 28th St., Milwaukee, Wis.

SAND SIFTING and SCREENING MACHINERY
American Air Filter Co., 262 Central Ave., Louisville, Ky.
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Foundry Supplies & Mfg. Co., 2221 Orchard St., Chicago, Ill.
Great Western Mfg. Co., Leavenworth, Kansas.
Link Belt Co., 300 W. Pershing Rd. Chicago, Ill.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Royer Foundry & Machine Co., Kingston, Pa.

SAND STORAGE BINS and GATES
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Link Belt Co., 300 W. Pershing Rd. Chicago, Ill.
National Engineering Co., 549 W. Washington St., Chicago, Ill.

SANDING MACHINERY
Delta Mfg. Co., Industrial division, 695 E. Vienna Ave., Milwaukee, Wis.
Oliver Machinery Company, Grand Rapids, Mich.

SAWS (Band, Metal, Wood)
Delta Mfg. Co., Industrial division, 695 E. Vienna Ave., Milwaukee, Wis.
Oliver Machinery Company, Grand Rapids, Mich.

SAWS (Cold Metal)
Bethlehem Steel Co., Bethlehem, Pa.
Tabor Mfg. Co., 6225 Tacony St., Philadelphia, Pa.

SCALING HAMMERS
Dayton Pneumatic Tool Co., Dayton, O.

SCHOOLS (Correspondence)
McLain's System, Inc., Goldsmith Bldg., Milwaukee, Wis

SCREENS
Ajax Flexible Coupling Co., Westfield, N. Y.
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Robins Conveying Belt Co., Passaic, N. J.
Simplicity Engineering Co., Durand, Mich.

SEA COAL
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Midwest Foundry Supply Co., Edwardsville, Ill.
Smith Facing & Supply Co., 1857 Carter Rd., Cleveland, O.
Frederic B. Stevens, Inc., Detroit, Mich.

SEPARATORS (Abrasive)
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Pangborn Corp., Hagerstown, Md.

SEPARATORS (Air, Moisture, Oil)
American Air Filter Co., 262 Central Ave., Louisville, Ky.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Claude B. Schneible Co., 3953 Lawrence Ave., Chicago, Ill.
Pangborn Corp., Hagerstown, Md.

SEPARATORS (Magnetic)
Ajax Flexible Coupling Co., Westfield, N. Y.
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Dings Magnetic Separator Co., 512 E. Smith St., Milwaukee, Wis.
Stearns Magnetic Mfg. Co., 662 S. 28th St., Milwaukee, Wis.

SHAKE-OUT MACHINERY
Ajax Flexible Coupling Co., Westfield, N. Y.
American Air Filter Co., 262 Central Ave., Louisville, Ky.
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh, Pa.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
New Haven Vibrator Co., 131 Chestnut St., New Haven, Conn.
Royer Foundry & Machine Co., Kingston, Pa.
Simplicity Engineering Co., Durand, Mich.

SHOT and GRIT
Alloy Metal Abrasive Co., 311 W. Huron St., Ann Arbor, Mich.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
American Steel Abrasives Co., Galion, O.
Cut Steel Abrasives Inc., P. O. Box 394, Youngstown, O.
Globe Steel Abrasive Co., Mansfield, O.
Great Lakes Foundry Sand Co., United Artists Bldg., Detroit, Mich.
Hickman-Williams & Co., Cleveland, O.
Pangborn Corp., Hagerstown, Md.
Pittsburgh Crushed Steel Co., Pittsburgh, Pa.
Parsons Engineering Co., Cleveland, O.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

SHOVELS
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Frederic B. Stevens, Inc., Detroit, Mich.
Ingersoll Steel & Disc Division, Borg-Warner Corp., New Castle, Ind.

SILICON—See FERROSILICON and BRIQUETS

SILICA FLOUR
Ottawa Silica Co., Ottawa, Ill.

SILICON (Briquets)
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.

SILICON CARBIDE (Briquets)
Carborundum Co., Niagara Falls, N. Y.

SKIMMERS
Tamms Silica Co., 228 N. LaSalle St., Chicago, Ill.

SKIP HOISTS
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Gardner-Denver Co., Gardner Drive, Quincy, Ill.
National Engineering Co., 549 W Washington St., Chicago, Ill.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

SLIP JACKETS
Adams Co., 700 Foster St., Dubuque, Ia.
American Foundry Equipment Co., 505 S. Byrkit St. Mishawaka, Ind.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.

SNAP FLASKS
Adams Co., 700 Foster St., Dubuque, Ia.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.

SODA ASH
Great Lakes Foundry Sand Co., United Artists Bldg., Detroit, Mich.
Hercules Powder Co., 999 Market St., Wilmington, Del.
Mathieson Alkali Works, Inc., 60 E. 42nd St., New York, N. Y.

SPECIAL FOUNDRY ALLOYS
Vanadium Corp. of America, 420 Lexington Ave., New York, N. Y.

SPIEGELEISEN
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.

SPRUE CUTTERS
Scully-Jones & Co., 19th & Rockwell, Chicago, Ill.

STAMPS & HOLDERS (Steel)
M. E. Cunningham Co., 97 E. Carson St., Pittsburgh, Pa.

STARS (Tumbling)
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

STEEL (High Speed)
Bethlehem Steel Co., Bethlehem, Pa

STEEL (Structural)
American Bridge Co., Pittsburgh, Pa.
Bethlehem Steel Co., Bethlehem, Pa.

—*When writing advertisers, please mention* THE FOUNDRY—

TIECO
FOUNDRY LADLES

TIECO geared ladles eliminate binding or sticking gear troubles. This patented feature assures accurate pouring and long life, due to the absence of drops and jerks and all trouble due to distortion or springage of the Bail or Bowl or both, caused by heat is removed. TIECO Ladles come in all types and sizes and are furnished for manual or electric operation.

Write for descriptive literature.

THE INDUSTRIAL EQUIPMENT COMPANY
115 OHIO STREET · MINSTER, OHIO

100% In The FIGHT!

Here's the kind of help that industry needs today! The PANGBORN-NORBIDE* "Long-Life" Blast Cleaning Nozzle is the hardest working, toughest wearing "distributor" of abrasive that ever came down the pike!

Lined with the hardest substance ever made by man for commercial use, he'll outlive 1,500 hours with steel abrasive and 750 hours with sand.

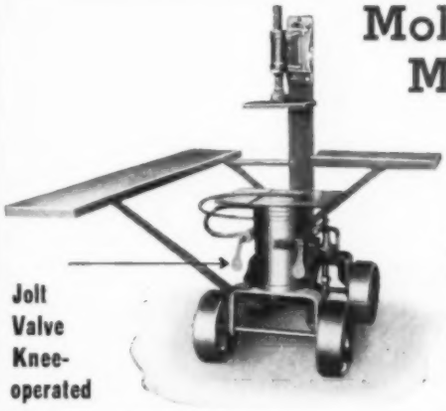
WRITE US—WE STOCK ALL STYLES AND SIZES

*Trade Mark of Norton Co. for Boron Carbide

PANGBORN CORPORATION
The World's Largest Manufacturer of Blast Cleaning and Dust Collecting Equipment
HAGERSTOWN · · · · MARYLAND

THE
JACKSON IRON & STEEL COMPANY
Manufacturers of
"JISCO"
SILVERY
PIG IRON SPECIALTIES
JACKSON OHIO

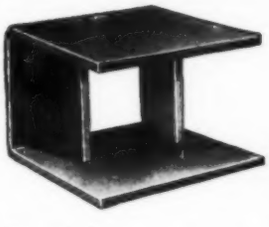
Molding Machine



NEW
R9X
RAPID JOLT

with 30% more Jolting Capacity. Prompt delivery. See your nearest distributor or write—

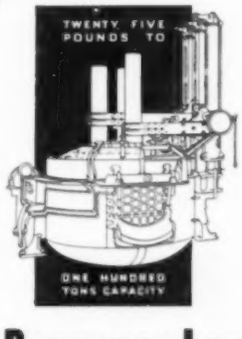
PIONEER MFG. CO.
(Milwaukee)
West Allis, Wis.



"DOUBLE ANGLE" CHAPLETS

One of the many types belonging to the great Buffalo Chaplets family. The "Double Angle" chaplet is a strong, single piece, well made. It is carefully tinned, fuses readily, and does not chill. It comes in four different gauges of metal, for light, medium and heavier work.

COMBINED SUPPLY & EQUIPMENT CO., INC.
215 CHANDLER ST.
BUFFALO, N. Y.



Moore Rapid
Lectromelt
Furnaces

Door charge and top charge types of furnaces for rapid and economic production of gray and malleable irons and carbon and alloy steels.

PITTSBURGH LECTROMELT FURNACE CORP.
PITTSBURGH, PA.

BLAW-KNOX ROLLER GATE FOUNDRY BUCKETS

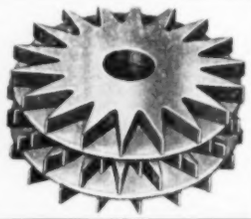
The Blaw-Knox Roller Gate Foundry Bucket solves a problem that has vexed foundry men for many years — namely, easily controlled discharge of foundry sand through a "bottom dump" hook-on type bucket. These buckets, made in standard capacities from 1 to 8 cubic yards, are fully described and illustrated in NEW Catalog 1696, which will be sent on request.

BLAW-KNOX DIVISION
OF BLAW-KNOX COMPANY
Farmers Bank Building
Pittsburgh, Pa.

BLAW-KNOX BUCKETS

Grinding Wheel Dressers

■ We manufacture the only complete line of dressers and cutters. Write for copy of catalog "F" and name of your nearest dealer.



DESMOND-STEPHAN MFG. CO.
Urbana, Ohio
Canadian D. S. Mfg. Co., Hamilton, Ont.

Sweat knows no season

■ Even in winter men on hot jobs lose too much salt through sweating. Give them Fairway Saltabs to replace it.

FAIRWAY SALTABS
An Aid in the Prevention of Heat Sickness
FAIRWAY LABORATORIES ST. LOUIS, MO.

CHIPPING CHISELS

Built Up to a Standard
Not Down to a Price!

Craftsmanship plus constant usage of the finest quality basic raw materials are combined in the production of our chipping chisels. We can furnish the right chisel for every job.

MILLS UTILITIES S FOUNDRIES

ALSO A COMPLETE LINE OF CHIPPING HAMMER BUSHINGS

STEEL CONVERSION & SUPPLY CO.
P.O. BOX 537 (CASTLE SHANNON) PITTSBURGH, PA.

WHERE-TO-BUY

STEEL WASH
Dayton Oil Co., Dayton, O.
STOKERS
American Engineering Co., 2418 Aramingo Ave., Philadelphia, Pa.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.
STRIPPING MACHINES
Champion Foundry & Machine Co., 1314 West 21st St., Chicago, Ill.
Davenport Machine & Foundry Co., Davenport, Iowa
International Molding Machine Co., 2608 W. 16th St., Chicago, Ill.
Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.
TESTING LABORATORIES
Harry W. Dietert Co., 9330A Roselawn Ave., Detroit, Mich.
Chas. C. Kawin Co., 431 So. Dearborn St., Chicago, Ill.
TESTING MACHINERY
Riehle Testing Mach. Div., American Mach. & Metals Inc., East Moline, Ill.
TIMERS (Electric)
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh, Pa.
TONGS
Industrial Equipment Co., Minster, O.
TOOLS (Pneumatic, Portable)
Chicago Pneumatic Tool Co., 6 East 44th St., New York.
Cleveland Pneumatic Tool Co., 3734 East 78th St., Cleveland, O.
Gardner-Denver Co., Gardner Drive, Quincy, Ill.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
TOOLS (Tungsten, Titanium, Carbide Tipped)
McKenna Metals Co., 131 Lloyd Ave., Latrobe, Pa.
TORCHES and BURNERS (Acetylene, gas, oil)
National Cylinder Gas Co., 205 W. Wacker Drive, Chicago, Ill.
North American Mfg. Co., 2910 E. 75th St., Cleveland, O.
TRAMRAIL SYSTEMS
American MonoRail Co., 13104 Athens Ave., Cleveland, O.
Chicago Tramrail Co., 2910 Carroll Ave., Chicago, Ill.
Cleveland Tramrail Div. of Cleveland Crane & Engineering Co., 1155 East 283rd St., Wickliffe, O.
Modern Equipment Co., Dept. 182, Port Washington, Wis.
TROLLEYS
Curtis Pneumatic Machinery Co., 1922 Kienlen Ave., St. Louis, Mo.
Modern Equipment Co., Dept. 182, Port Washington, Wis.
TRUCK WHEELS
Bethlehem Steel Co., Bethlehem, Pa.
Sterling Wheelbarrow Co., 7100 W. Walker St., Milwaukee, Wis.
TUBES (X-Ray)
Picker X-Ray Corp., 300 Fourth Ave., New York City.
TUMBLING BARRELS
Cleveland Chaplet & Mfg. Co., W. 67th St. and N.Y.C. Ry., Cleveland, O.
N. Ransohoff Inc., 208 W. 71st St., Cincinnati, O.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.
Tabor Mfg. Co., 6225 Tacony St., Philadelphia, Pa.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.
TURRETS for LATHES
Jefferson Machine Tool Co., Cincinnati, Ohio.
TURNTABLES
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Modern Equipment Co., Dept. 182, Port Washington, Wis.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.
VACUUM CLEANING EQUIPMENT
Roots-Connersville Blower Corp., 106 Madison Ave., Connersville, Ind.
VALVES, AIR
New Haven Vibrator Co., 131 Chestnut St., New Haven, Conn.
VALVES (Air, Water, Steam)
Air-Way Pump & Equipment Co., 405 S. Jefferson St., Chicago, Ill.
Galland-Henning Mfg. Co., 2761 So. 31st St., Milwaukee, Wis.
North American Mfg. Co., 2910 E. 75th St., Cleveland, O
VALVES (Adjustable Orifice)
North American Mfg. Co., 2910 E. 75th St., Cleveland, O.
VALVES (Blow-off and Cut-off)
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.
Wm. H. Nicholls Co., Richmond Hill, Long Island, N. Y.
VENTILATING SYSTEMS
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Claude B. Schneible Co., 3953 Lawrence Ave., Chicago, Ill.
Industrial Sheet Metal Wks., 325 E. Forest Ave., Detroit, Mich.
Pangborn Corp., Hagerstown, Md.
Parsons Engineering Co., Cleveland, O.
VENTS (Core Box)
Wm. Demmler & Bros., Kewanee, Ill.
C. M. Smillie & Co., 520 East Larned St., Detroit, Mich.
VIBRATORS
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Cannon Vibrator Co., 1111 Power Ave., Cleveland, O.
Davenport Machine & Foundry Co., Davenport, Iowa
Foundry Supplies & Mfg. Co., 2221 Orchard St., Chicago, Ill.
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh, Pa.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.
New Haven Vibrator Co., 131 Chestnut St., New Haven, Conn.
Wm. H. Nicholls Co., Richmond Hill, Long Island, N. Y.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.
Peerless Tools Inc., Milford, Conn.
S P O Incorporated, E. 61st St. and Waterman Ave., Cleveland, O.
Syntron Company, Homer City, Pa.
Tabor Mfg. Co., 6225 Tacony St., Philadelphia, Pa.
WASHFOUNTAINS
Bradley Washfountain Co., 2217 W. Michigan St., Milwaukee, Wis.
WAX (Core, Vent, Pattern)
United Compound Co., Inc., 328 South Park Ave., Buffalo, N. Y.
WEDGES (Foundry)
Sterling Wheelbarrow Co., 7100 W. Walker St., Milwaukee, Wis.
WELDING GAS
Air Reduction Sales Co., 60 East 42nd St., New York, N. Y.
National Cylinder Gas Co., 205 W. Wacker Drive, Chicago, Ill.
WELDING and CUTTING APPARATUS and SUPPLIES
Air Reduction Sales Co., 60 East 42nd St., New York, N. Y.
National Cylinder Gas Co., 205 W. Wacker Drive, Chicago, Ill.
WELDING ROD
Air Reduction Sales Co., 60 East 42nd St., New York, N. Y.
National Cylinder Gas Co., 205 W. Wacker Drive, Chicago, Ill.
WHEELBARROWS
Sterling Wheelbarrow Co., 7100 W. Walker St., Milwaukee, Wis.
WHEELS (Cut-off)
West Co. Inc., 1117 Shackamaxon St., Philadelphia, Pa.
WHEELS (Wire)
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.
WIRE BRUSHES
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.
WIRE CLOTH
Buffalo Wire Works Co., 425 Terrace, Buffalo, N. Y.
WIRE NAILS
Bethlehem Steel Co., Bethlehem, Pa.
WIRE ROPE
American Cable Division of American Chain & Cable Co., Inc., Wilkesbarre, Pa.
Hazard Wire Rope Division of American Chain & Cable Co., Inc., Wilkesbarre, Pa.
WOODWORKING MACHINERY
Delta Mfg. Co., Industrial division, 695 E. Vienna Ave., Milwaukee, Wis.
Oliver Machinery Co., Grand Rapids, Mich.
X-RAY EQUIPMENT
General Electric X-Ray Corp., 2012 Jackson Blvd., Chicago, Ill.
X-RAY FILMS
Picker X-Ray Corp., 300 Fourth Ave., New York City.

—When writing advertisers, please mention THE FOUNDRY—

Buckeye Silica Firestone

Sawed or Split

---a natural rock for LINING---

Soaking Pits . . . Blast Furnace Ladles
Bessemer Converters . . . Mixers
Grey Iron Cupolas
Foundry Crane Ladles
Air Furnaces . . . Drop Forge Bottoms
Acid Pickling Tanks

LASTS LONGER COSTS LESS

Write for Literature

The Cleveland Quarries Co.
1125 Builders Exchange Building
Cleveland, Ohio

CONSTANT HIGH SPEED IN THE MOTOR

GEARED HEAD

Assures CONSTANT HIGH SPEED IN THE TOOL

With a *Mall* TRADE MARK Flexible Shaft Grinder

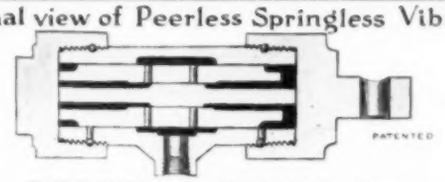
By maintaining their rated capacity in the working tool, MALL electrically-driven Constant High Speed Flexible Shaft Geared-Head Grinders are rapidly replacing less efficiently powered grinding tools in industries everywhere.

These direct-drive machines eliminate power losses due to belt slippage, poor alignment, air hose leaks and other failures. They lengthen the cutting life of tools, they reduce the number of rejects and increase production. In addition, interchangeable tools that can be changed as quickly and easily as bits in a brace make these units readily convertible for Grinding, Disc, Cone and Drum Sanding, Wire Brushing, Polishing and Drilling.

You'll find MALL Geared-Head Grinders the most useful tools in your foundry. They are easy to keep busy . . . can be rolled to the work . . . and operate from any regular electric current outlet. Two types of mountings—"caster base" and "overhead trolley" broaden the adaptability of these units. Light weight tools that lessen fatigue and a highly efficient motor winding to dissipate operating heat further increase the efficiency of these units. You'll find many other advantages in these tools that can be translated into net profit. We'll gladly arrange a FREE Demonstration in your plant. Write AT ONCE for full details and 1942 catalog of Industrial Equipment.

MALL TOOL COMPANY
7720 SOUTH CHICAGO AVE. CHICAGO, ILLINOIS

Sectional view of Peerless Springless Vibrators



PEERLESS TOOLS, Inc.
MILFORD, CONN. U.S.A.

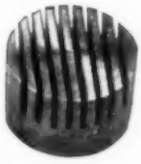
CONSULTING FOUNDRY ENGINEER
STEEL FOUNDRY AND OPEN HEARTH PRACTICE
SAND MIXES—SAND CONTROL
METALLURGICAL AND OPERATING PROBLEMS

HERBERT F. MILLER JR.
P. O. BOX 1976 CLEVELAND, OHIO

SALT LOSS CAUSES HEAT FAG
WORKERS WHO *Sweat* NEED *Salt*
• USE MORTON'S SALT TABLETS •
Morton Salt Co., Chicago, Illinois

PRODUCERS CORE SAND CORPORATION
PITS AT MICHIGAN CITY, INDIANA AND SAWYER, MICHIGAN
MICHIGAN CITY, INDIANA

For Better Blown Cores, Use
DEMMLER CORE BOX VENTS

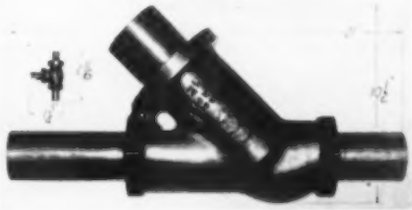


PERFORATED VENTS
No. 00, No. 0, No. 1 or No. 2 holes

SLOTTED VENTS
Brass or Steel
Slots .010" to .015"

WM. DEMMLER & BROS.
Kewanee - Illinois

COPPER PATTERNS
Made by **ELECTRO FORMING**



These metal patterns containing three ounces and seven pounds of deposited copper respectively, made from single shrink patterns.

Send us your working wood or metal pattern, single shrink, and we will reproduce the required number of copper patterns to fill a plate.

Accuracies two to three thousandths of an inch.

Send for Folder *Samples upon request*

ELECTRO-CHEMICAL PATTERN & MFG. CO.
3969-3975 Beaufait Ave. Detroit, Michigan

Classified Advertising

Help Wanted

NOTICE!

We are building a large steel foundry and machine shop in the St. Louis industrial district and have the following key positions to fill:

Green Sand Steel Foundryman

Metallurgist having experience with alloy steels and heat treatment of steel castings.

Open Hearth Superintendent having experience in basic practice.

Machine Shop Superintendent having experience with heavy milling machines, planers, and boring mills and general production experience.

Maintenance Engineer

Master Mechanic

Chief Inspector

as well as other minor positions.

Address J. Ellis Turner, General Steel Castings Corporation, Eddystone, Pa., stating your experience and personal history fully. Personal interview may be arranged by appointment only.

GENERAL STEEL CASTINGS CORPORATION

EDDYSTONE, PENNSYLVANIA

SELL FOR DEFENSE

Newly developed welding process adopted in defense production and vital maintenance work, with sensational outstanding performance and sales results. Have few territories open: Cincinnati, St. Louis, Philadelphia, Baltimore, Virginia, Texas, New Orleans, Tulsa, Kansas, Denver, San Francisco, and St. Paul-Minnesota, Columbus and Michigan. Efficient and introduced man can build up excellent following, specialized experience unnecessary. Good deliveries. Send for information, indicating past activity. Address Box 601, The FOUNDRY, Cleveland.

INSPECTOR

Wanted on rough and machined castings—engineering experience preferable. Address Box 593, The FOUNDRY, Cleveland.

FOUNDRY FOREMAN

Wanted immediately. Steel foundry—Pittsburgh district. State age, qualifications, references and salary expected. Address Box 592, The FOUNDRY, Cleveland.

SALES ENGINEER

Large, well established, prosperous company, one of the leaders in its field, is seeking a sales engineer. We prefer a young man, college graduate with technical training, preferably someone with foundry experience. A permanent connection with an attractive future for the right man. In reply give age, education, married or single and full details with respect to previous connections. Address Box 567, The FOUNDRY, Cleveland.

FOUNDRY SUPERINTENDENT

Wanted, with experience in corrosion and heat resisting alloys. Address Box 594, The FOUNDRY, Cleveland.

WANTED: METALLURGIST

CAPABLE OF OVERSEEING THE PRODUCTION OF STRAIGHT CARBON AND ALLOY STEEL CASTINGS—ELECTRIC FURNACE STEEL FOUNDRY LOCATED IN EASTERN PENNSYLVANIA.

Prefer a man who is familiar with gamma-raying castings and magnetic testing. In reply state age, experience and salary desired. Address Box 602, The FOUNDRY, Cleveland.

Help Wanted

STEEL FOUNDRY SUPERINTENDENT

Milwaukee Area

Can now be employed as assistant. Salary commensurate with ability. Write full details, experience to Box No. 595, The FOUNDRY, Cleveland.

ATTENTION SALESMEN!

Representatives now calling on foundries regularly are wanted by a well-known manufacturer of high grade line of plumbago, facings, parting, blacking, core wash and allied foundry items. Liberal commission basis. Please advise territory covered, lines now handled, experience with foundry items, etc. Address Box 217, THE FOUNDRY, Cleveland.

WANTED

Man with foundry experience to represent a molding sand corporation which now has large established trade in northern and middle Ohio. Give full particulars, age, experience, etc. Address Box 577, The FOUNDRY, Cleveland.

SALES ENGINEER

A well established concern is seeking a salesman, preferably around 40 years of age, thoroughly acquainted with purchasing and operating personnel of foundries in New York, Pennsylvania, and New England states. This is a wonderful opportunity for a man used to making good money. Give age, education, previous connections and all other details in first reply. Our salesmen have been advised of this advertisement. Address Box 576, The FOUNDRY, Cleveland.

FOUNDRY FOREMAN

Wanted for western jobbing foundry employing about 50 men; iron, steel and bronze castings. State age, experience in detail and salary expected. Address Box 578, The FOUNDRY, Cleveland.

SALES REPRESENTATIVES

Established foundry supply house wishes to engage the service of additional sales representatives in New England and Ohio. Address Box 572, The FOUNDRY, Cleveland.

COREROOM FOREMAN

Jobbing malleable foundry making various sizes of cores wants a man to take charge of coreroom. Must have experience with core blowing machines. Write, state qualifications as to past experience, references, salary, etc. Address Box 596, The FOUNDRY, Cleveland.

RESEARCH ENGINEER

Manufacturer of foundry facing, core oils and allied products wishes to engage the service of a research engineer. In reply give full details as to previous connections. Address Box 571, The FOUNDRY, Cleveland.

WORKING FOUNDRY FOREMAN

Must have several years' experience in gray iron and semi-steel, medium and heavy castings. Good position for the right man. Give full details in letter. Address Box 600, The FOUNDRY, Cleveland.

CHIEF INSPECTOR

Wanted immediately. Steel foundry—Pittsburgh district. State age, qualifications, references and salary expected. Address Box 591, The FOUNDRY, Cleveland.

ASSISTANT SUPERINTENDENT

Wanted by heating equipment manufacturer located in the East. Must be an experienced foundryman, preferably one with a technical training. This position offers a good opportunity for advancement to an aggressive younger man. Give complete outline of experience and other facts of interest in first letter. Address Box 617, The FOUNDRY, Cleveland.

CLASSIFIED RATES

Position Wanted: 5c per word, minimum $1.50; Help Wanted: 6c per word, minimum $3.00. All other type advertisements: 10c per word, minimum $3.00. Copy should be received not later than 13th of month preceding date of issue. Address: The FOUNDRY, Penton Building, Cleveland.

Help Wanted

DRAFTSMAN WANTED

Experienced at detail work on vibrating screens by established manufacturer. Located in attractive small town. Position permanent. Write in confidence giving full particulars. Our men know about this opening. Address Box 608, The FOUNDRY, Cleveland.

WELDING INSTRUCTOR AND OXY-ACETYLENE SUPERVISOR

Wanted in steel foundry cleaning room. Must be graduate engineer with ability to organize and train men. In answering please state age, experience, references and salary expected. Address Box 609, The FOUNDRY, Cleveland.

PRACTICAL FOUNDRY SUPERINTENDENT

Wanted who is capable of operating small steel foundry in the production of manganese steel castings. Address Box 610, The FOUNDRY, Cleveland.

MAN TO TAKE CHARGE OF PRODUCTION

In stainless foundry is wanted by an established midwestern company—one of the leading producers of special alloys. This department employs 90 men including 15 molders and 3 foremen. Applicant should be thoroughly acquainted with present-day heading, gating, rigging and sand practices. Desired person would take complete charge of foundry operations. Melting is under laboratory control. Please give full details in first letter. Address Box 607, The FOUNDRY, Cleveland.

PRACTICAL FOUNDRYMAN

Who knows the aluminum foundry business thoroughly. Not a college graduate but a man who must be able to assume responsibility. Great opportunity for the right individual. Position open with large aluminum foundry located in Middle West manufacturing high-grade aeronautical and other aluminum castings. Address Box 615, The FOUNDRY, Cleveland.

Positions Wanted

METALLURGIST AND PRACTICAL FOUNDRYMAN

Many years' experience in foundry research, management, and sales work wishes to connect with manufacturer of foundry supplies or foundry equipment in capacity of consultant and representative on salary basis. Address Box 611, The FOUNDRY, Cleveland.

METALLURGICAL ENGINEER

With 20 years' experience in manufacture of light and medium gray iron castings, specialist in cupola operation, sand control and research in all phases of foundry engineering desires position in research or managing capacity. Address Box 612, The FOUNDRY, Cleveland.

ELECTRICAL ENGINEER, CHIEF ELECTRICIAN or ASSISTANT MASTER MECHANIC

Broad experience in maintenance and construction. Fifteen years' experience in steel foundries. Address Box 604, The FOUNDRY, Cleveland.

FOUNDRY FOREMAN OR SUPERINTENDENT

Practical experience in all departments on light and medium gray iron and semisteel castings. Expert on cupola practice, mixing by analysis, a general run of jobbing. At present employed. Twenty-five years' experience as superintendent and foreman. Can furnish good references. Is 56 years old. Address Box 605, The FOUNDRY, Cleveland.

FOUNDRY FOREMAN

For general jobbing shop. Has had twenty-two years as foundry foreman. Practical man in green and dry sand, medium and heavy castings. Now employed. Prefers Central West. Address Box 616, The FOUNDRY, Cleveland.

MANAGER-SUPERINTENDENT-METALLURGIST

Available, 27 years' experience, demonstrated ability. Ten years testing engineer or metallurgist; 17 years foundry foreman, superintendent, manager. Two technical degrees. McLain graduate. Intimate knowledge wide variety gray iron, malleable, steel, nonferrous, centrifugal casting, specialist permanent molds. Some ordnance work. Seek place with concern with future. Now on war work. Location immaterial. A-1 references. Address Box 603, The FOUNDRY, Cleveland.

Classified Advertising

Positions Wanted

GENERAL PATTERN SUPERVISION OR FOLLOW UP MAN

For pattern equipment and castings. Nineteen years' experience. Two years general supervision jobbing shop, three years layout and checking, six years wood patternmaker, eight years metal patternmaker bench and machine. Is a competent estimator and experienced in aircraft and motor patterns, thirty-five years old, married, two dependents, American born, not in defense work. Address Box 597, The FOUNDRY, Cleveland.

WORKS MANAGER OR SUPERINTENDENT

Thoroughly experienced young steel foundry executive, 20 years' experience, now employed, desires a change. Can take full charge of miscellaneous or specialty steel foundry. Well acquainted with young executives in the industry who know how to get things done under present-day conditions. Can furnish complete or part organization for new or expanding plant. Location preferred Pacific Coast or Pacific Northwest. Address Box 584, The FOUNDRY, Cleveland.

COREROOM FOREMAN

Forty years old; assistant coreroom foreman past five years. Desires position which affords opportunity to prove self and qualifications. First class corcmaker gray iron and diesel engines, locomotives and pumps, etc. At present employed. Address Box 593, The FOUNDRY, Cleveland.

GENERAL MANAGER

Mature, profit-minded, dependable. Has successfully managed four companies—taken two out of the red. Available for service shortly with medium-size company requiring reliable directing ability in management, sales, finance and production. Extensive experience foundry, machinery, tool and related lines. Address Box 310, The FOUNDRY, Cleveland.

FOUNDRY SUPERINTENDENT

Having twenty four years as Foundry Superintendent, practical molder, technical education, desires position with foundry making high grade castings. Address Box 583, The FOUNDRY, Cleveland.

NONFERROUS FOREMAN

Broad practical experience including steam valves, high pressure castings and general jobbing and production work. Address Box 581, The FOUNDRY, Cleveland.

FOUNDRY SUPERINTENDENT

Employed at present. Desire change of connections. Can efficiently manage any foundry including cupola practice, molding machines, sand control (green and dry sand) coreroom management. Prefer continuous molding position. Twenty-five years' experience. Address Box 613, The FOUNDRY, Cleveland.

Employment Service

SALARIED POSITIONS

$2,500 to $25,000

This thoroughly organized advertising service of 32 years recognized standing and reputation, carries on preliminary negotiations for positions of the caliber indicated above, through a procedure individualized to each client's personal requirements. Several weeks are required to negotiate and each individual must finance the moderate cost of his own campaign. Retaining fee protected by refund provision as stipulated in our agreement. Identity is covered and, if employed, present position protected. If your salary has been $2,500 or more, send only name and address for details.

R. W. BIXBY, INC.

101 Delward Bldg., Buffalo, N. Y.

Accounts Wanted

ENGINEER SALES AGENCY

Now handling heat-treating furnaces desires additional lines salable to industrial plants in the New York metropolitan and surrounding areas. Commission basis. Address 618, The FOUNDRY, 110 E. 42nd St., New York, N. Y.

Opportunity

DEFENSE AND POST WAR PRODUCTS

Equip your foundry for defense and post war products. Machines eliminate labor. Duplicate work—lowest costs. A permanent business. Address Box 606, The FOUNDRY, Cleveland.

Wanted-To-Buy

WANTED TO BUY

1300 to 1500 air compressor, or enough compressors to make 1500 ft. air. Also 150 KW 2300—250 V motor generator.

RUSSELL STANHOPE,
60 East 42nd Street,
New York, N. Y.

We Want SANDSLINGERS

We are in the market for used **sandslingers.** State type, year, condition and bottom price for immediate acceptance. Address Box 207, The FOUNDRY, Cleveland.

MIXERS WANTED

Used Simpson Intensive Sand Mixers. State size, condition and lowest cash price for immediate acceptance. Address Box 578, The FOUNDRY, Cleveland.

Foundries For Sale

TO SETTLE ESTATE

Modern gray iron foundry on 5 acre site with side track on B. & O. R. R. Concrete building 200' x 72', sand sheds and small office in connection. Molding space 200' x 72' has two 6 ton electric cranes operating independently or together. Has all necessary equipment including cleaning room, machine and carpenter shops in space 100' x 72'. Complete sprinkler system and ample storage space.

Trust Department

THE CITIZENS SAVINGS BANK & TRUST CO.
Hamilton, Ohio

FOR SALE

FOUNDRY - MACHINE SHOP - PATTERNSHOP and storage sheds on lot 170 ft. x 200 ft. with side track. On main line Southern Railway in northern Georgia. Address Box 614, The FOUNDRY, Cleveland.

FOUNDRY FOR SALE

Gray iron foundry on main line of B. & M. R.R. with side track. Buildings in fair condition and sprinkled throughout. Plot area approximately 40,000 square feet.

GARDNER TRUST COMPANY
Gardner, Mass.

For Sale

FOR SALE

Several D. C. Motors from ½ H. P. up to 25 H. P.—several makes.

1 Worthington circulating pump, serial No. 875357, with A. C. motor.

Excess stock of molding machines, several types.

Several sizes of Sly exhaust round tumbling barrels.

1 Band saw, belt-driven, with 5 H. P. D. C. motor.

1 Oliver planer, belt-driven, 24", no motor.

If interested, further information will be given by:

THE EASTERN MALLEABLE IRON COMPANY
WILMINGTON, DELAWARE

FOR SALE

1 Herman Pneumatic 42" Dia. jarr molding machine, bumper type, equipped with auto pressure grease lubrication, air tank 12" dia. x 6' long. Serial No. 2838, never operated. **East Penn Foundry Company, Macungie, Pennsylvania.**

FOR SALE

Royer model D. C. combination scrap remover, sand separator and blender.

THE ELYRIA BELTING & MACHINERY CO., ELYRIA, OHIO

FOR SALE

One complete mold conveyor and overhead sand handling system manufactured by C. O. Bartlett & Snow Co., Cleveland, Ohio. Also tumbling barrels, dust arrestors, sandblast barrels, and other miscellaneous foundry equipment. Address Box 574, The FOUNDRY, Cleveland.

REBUILT

BLOWERS—FANS—EXHAUSTERS

Roots-Connersville positive cupola blowers. Centrifugal blowers for gas and oil burning. Sand blast, grinder and dust exhausters. Ventilating fans.

GENERAL BLOWER COMPANY

406 N. Peoria St. Chicago, Illinois

REBUILT COMPRESSORS AND BLOWERS

2800 CFM, @ 1 lb. North American Turbo Compressor with 20 H.P., 2600 RPM A.C. motor.

1250 CFM, @ 3¼ lbs., 2600 RPM Gen. Elec. with 30 H.P. A.C. motor drive.

(3) Buffalo Forge Pressure Blowers, 1200 cfm @ 11 oz., 9½" inlet, 7 x 7 outlet, driven by 7½ H.P. A.C. Motors.

450 CFM, 2500 RPM Gen. Elec. with 6.2 H.P. A.C. motor drive.

SAND VIBRATOR

Jeffery-Traylor, shaker type CV2-8, 6" wide hand deck, capacity 7 to 8 tons sand per hour; with 15 cycle, 110 volt, single phase vibrator motor generator set. Write, wire or phone.

The Motor Repair & Mfg. Co.

1552 Hamilton Ave. Cleveland, Ohio

FOUNDRY CRANE LADLE FOR SALE

Average I. D. (Lining) 48"
Average Depth (Lining) 44"

APPROXIMATE CAPACITY 20,000 LBS.
Used, in good condition

THE COX & SONS CO.
Bridgeton, New Jersey

Classified Advertising

For Sale

FOR SALE

One (1) Herman Pneumatic Machine Company 60" x 72"—10,000 lbs. series, independent turn-over and pattern drawing device. Equipped with booster cylinder with speed control, and standard short arms.
One (1) Herman Pneumatic Machine Company 48" x 72" jarring molding machine. Heavy Duty tumper type, with extended cylinder.
Above equipment is in good condition and may be inspected at the factory of owner, located in northeastern Ohio. Address Box 598, The FOUNDRY, Cleveland.

REBUILT USED EQUIPMENT

Molding machines, all types; tumbling mills; furnaces; cupolas; air compressors; hoists; rammers, all types; ladles, all types; sand mixers; sand blast tanks; core machines, etc. All equipment rebuilt and guaranteed. All sizes used steel flasks.

HAYNES FOUNDRY EQUIPMENT COMPANY
1734 Lake St. Kalamazoo, Mich.

FOR SALE
PANGBORN SANDBLAST BARREL
Type GH1 No. 3
In good condition. Inquire

National Foundry Company of New York, Inc.
10 Sandford Street, Brooklyn, N. Y.

FOR SALE

Used Herman 40" x 50" plain jarring machine, rebuilt in 1937. Address Box 540, The FOUNDRY, Cleveland.

EQUIPMENT IN STOCK REBUILT
GUARANTEED IMMEDIATE SHIPMENT

MOLDING MACHINES

(5) No. 275-J Osborn 10" Jolt Squeezers
(7) No. 276-J Osborn 13" Jolt Squeezers
(1) Tabor Jarr Squeeze Flask Lift Stripper Table 18" x 20½"
(1) No. 81 Osborn Jolt Squeeze Stripper Machine
(1) Osborn No. 602 Jolt Rollover Pattern Draw
(1) International Jarr Table 24" x 36"
(4) Herman Jarr, Table 40" x 60"
(4) Herman Jarr Strippers Table 40" x 60"
(6) Herman Jarr Rollover Pattern Draw, Table 30" x 36", 30" x 55", 40" x 50"
(1) 40" x 50" Tabor Jarr Rollover Pattern Draw

MISCELLANEOUS ITEMS

(4) 20" Coombs Riddles 110-VAC.
(2) No. 60 Fisher Crucible Furnaces Style "H"
(1) Gas Fired Young Bros. Core Oven 12'6" deep x 8' wide x 7'6" high, double doors
(1) ¾" cap. Shuster Power Sprue Cutter
(1) Dings Magnetic Separator type M-1

SAND MIXERS

(1) 10-cu. ft. Standard Gear Drive
(1) 8-ft. Simpson Mixer
(1) 4-ft. Simpson Mixer

AIR COMPRESSORS

(1) 12 x 10 Penna. 360-CFM. @ 100 lbs. idler belt, 60-HP, C.W. slip ring motor, 220-4-60 Cy. and control
(1) 12 x 12 Chicago N.S.B. 375-CFM @ 100 lbs. with idler, unloader and lubricator
(1) 2-stage Ing. Rand size 16 & 10½ x 12 cap. 770-CFM. @ 75 lbs. direct connected to a 125-HP. G.E. S/no. motor, 2300-3-60-cy. exciter, control, after cooler and tank.

ELECTRIC MONORAIL HOISTS

50—½ to 5-ton, 1 and 2-motor, Fl. and Cage Operated, 220/300-volts, 3PH, 60-CY. 110 and 230-VDC.

OVERHEAD ELECTRIC TRAVELING CRANES

1 to 50-ton Cap. 18' to 91'0" span, 220-440-VAC and 230-VDC. We operate the largest crane Rebuilding Plant in the country, send us your specifications for Cranes, Monorail Hoists, Electric Crane Motors, Standard Motors, Steel Buildings & Runways, we can quote you on equipment Rebuilt to your specifications.

ELECTRIC STEEL FURNACE

(1) 3-ton Heroult, with 1500-KVA transformer, 2300-volts, 3-phase, 60-cycle, Rebuilt to Your Specifications.

T. B. MACCABE CO.
1304 Clarissa St. Philadelphia, Pa.

For Sale

USED MOLDING MACHINES

1 Osborn No. 404 Direct Draw Roll-over Jolt.
1 Osborn No. 98 Core Jolt Machine.
7 International 19" x 4½ Type CEF Turn-over and draw.
10 International 17" x 17 x 6 Type TPN Stripping.
3 International 14" x 6 Type RES Jolt Squeeze Roll-over draw.
3 International 44" x 48 Type BDF Turn-over and draw.
4 International 17½ x 24 x 8 Type YF Hand Stripping.
6 Nicholls 14 x 26 Type D Heavy duty type D Combination Jolt Squeeze Strip Machine.

Inspection may be made at Plant of

NATIONAL MALLEABLE AND STEEL CASTINGS COMPANY,
10600 QUINCY AVENUE, CLEVELAND, OHIO

FOR SALE

Immediate Shipment

30" Tabor jar, rollover, pattern draw, machine
53" Gardner abrasive disc grinder, without motor
Old style No. 2 Simpson sand muller
8 ton, top pour, worm gear ladle
No. 8 and 9 Sturtevant pressure blowers

ROSEDALE FOUNDRY & MACHINE COMPANY
Columbus & Preble Avenues
N. S., Pittsburgh, Pennsylvania

FOR SALE

Osborn plain jolt 36 x 48 table—9" cylinder practically new.

Kansas City Hay Press Company
Kansas City, Mo.

FOR SALE

Two 500 LB. MONARCH SIMPLEX BRASS FURNACES. Address Box 599, The FOUNDRY, Cleveland.

Are **YOU** in need of foundry equipment?

Do **YOU** have equipment to sell?

Are **YOU** looking for experienced men?

Do **YOU** want to obtain a position?

If **"Yes"** is your answer to any of the above questions, may we offer the services of the Classified Advertising Department of The FOUNDRY? For rates write *today* to:

The FOUNDRY
Classified Advertising Department
Penton Building Cleveland

For Sale

FOR SALE

1—Sly No. 4 tilted sand blast barrels arranged for motor drive.
1—Sly No. 11 unit dust filter complete with fan and motor.

HERMAN L. WINTERER
955 N. Front St. Philadelphia, Pa.

AIR COMPRESSORS

BELTED—176 ft., 355 ft., 540 ft., 676 ft., 752 ft. & 1300 ft.
ELECTRIC—355 ft., 528 ft., 676 ft., 807 ft., 1302 ft., 1723 ft., 2022 ft., 2200 ft., 2800 ft., 3600 ft., & 5000 ft.
STEAM—368 ft., 500 ft., 800 ft., 1221 ft., 1640 ft., 2200 ft., & 3000 ft.
DIESEL—368 ft., 603 ft., 900 ft. & 1300 ft.
GASOLINE—110, 160, 220, 310, 1300 ft.

R. C. STANHOPE, INC.
60 East 42rd St. New York, N. Y.

FOR SALE

Barrett F C F bronze melting cupola furnace. Capacity one (1) ton per hour.

William A. Hardy & Sons Co.
Fitchburg, Mass.

FOR SALE

15-ton Lucas vertical power forcing press, arranged for motor drive. Address Box 541, The FOUNDRY, Cleveland.

SPECIAL WINTER BARGAINS

Air Compressor Units—Curtis 6 x 6 twin with 15 HP motor and starter-tank-belt and unloader 87 CFM displacement.
Ingersoll-Rand 10 x 10 with 40 H.P. Motor.
Fans—Blowers—Exhausters for cooling, ventilation and dust or fumes removal. Multivane Fans in all st'd. makes and styles for large air volumes at low pressures.
Fan or **Centrifugal** style blowers—Maxon-Premix—from No. 1 to No. 6, Spencer Turbine, Gen. Electric, Am. Blower Co., Sturtevant, Buffalo, Clarge, Ilg etc. for Gas or Oil fuel Combustion.
Rotary Pressure Blowers — Roots-Connersville, Garden City, Green, Piqua, Sturtevant, Am. Gas Furnace Co. etc.
Cupola 30" dia. shell ¾ to 1 ton cap. and larger.
Furnaces for Brass and Aluminum Melting—Hausfeld Tilting open flame 400 lb. brass cap.; Booth Electric 725 lb. brass cap. with instruments and transformer. Stationary Furnaces, swing top for crucibles No. 6 to No. 150 and open top for iron pots up to 300 lb. aluminum.
U. S. Size No. 4 Brass melting furnace.
Molding Machines—Osborn-75J. Osborn No. 401 stationary, jolt-squeeze-rollover-draw 20" x 30". Osborn No. 404-S, No. 405-S and No. 85 Pit Type jolt-squeeze-strippers. Arcade No. 3 "Modern" portable hand operated rollover draw, underneath runout carriage. "Berkshire" 34" wide stationary air squeeze. "Tabor" 8" cyl. air squeeze. "Battenfeld" (Johnston & Jennings) stationary jolt squeeze; 5 in stock. Arcade—portable 2 in stock 8 & 10" cyl. Adams—Stationary hand squeezers 48" wide 2 in stock. Tabor-Air Squeeze Stationary 48" wide, 16" cyl. Mumford—Stationary Air Squeeze 14 x 18" platen. Tabor—Hand operated, portable, Rollover, draw for 20 x 30" flasks or core boxes, 3 in stock. Nichols—10" x 32" Stationary 20 available. Tabor 28" x 41" portable shockless jarring rollover draw.
Crane Ladles 1 & 4 ton, Sly wet Cinder mill.
Sand Blasts—pressure generator tanks with hose & nozzles.
Sand Blast Barrel—New Haven 36 x 46" Motor direct connected.
Sand Blast Tables Pangborn 6' and 8' dia. self contained fine for brass and iron castings.
Blystone Sand Mixer.

Tell us your needs.

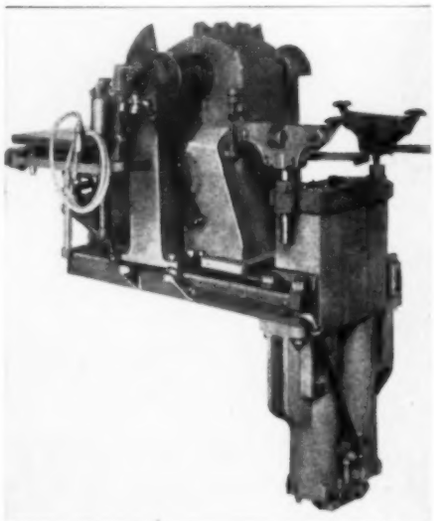
CLIFTON MACHINERY CO.
1023 W. 6th CINCINNATI, O.

"SCULLY-JONES" RECONDITIONED FOUNDRY EQUIPMENT

◆ Ready for immediate shipment, this equipment has been completely rebuilt in our modern machine shop. Prices on request.

INTERNATIONAL MOLDING MACHINES

1 49 x 16" draw Type "F," fitted with air equalizers, rollers in the draw section and hand operated core box clamps, jar plate 100" long, 6000 lbs. cap.



INTERNATIONAL TYPE "F"
(Enclosed Model)

48 x 16" draw Type "F"—4200 lbs. cap. @ 80 lbs., table size 48 x 83",
37 x 16" (adjustable draw, can be set to max. of 25") Type "F" table size 34 x 70", 3800 lbs. cap. @ 80 lbs. press.
31 x 16" draw, Type "F" table size 31 x 60", 2500 lbs. cap. @ 80 lbs. pres., with roll-off table and air equalizers.
42 x 16" draw Type "F" (with double cylinders) 3400 lbs. cap. @ 80 lbs. pressure.
26 x 8" draw International Type "F" 27" x 34" roll-over table.
26 x 12" Type "F" International 22 x 40" roll-over table.

OSBORN MOLDING MACHINES

No. 403 Osborn jolt roll-over and pattern draw, flask cap. 44 x 36", 12" draw, with swing-out Mold Table.

No. 602 Osborn jolt roll-over pattern draw, flask cap. max. length 36"—width 26"—11" draw, 900 lbs. jolt cap.

Herman INDEPENDENT TURN-OVER and PATTERN DRAWING DEVICE MACHINES

32 x 46" jar roll-over, 30 x 36" jolt table.
46 x 56" jar roll-over, 40 x 50" jolt table.
40 x 60"—15" dia. cyl. 9500 lbs. cap. @ 80 lbs. press., 42 x 60" jolt table.

PLAIN JOLTERS, stationary

Osborn, 18 x 36" table, 6" dia. cyl. 750 lbs. jolting cap. @ 80 lbs. press.
Arcade, 16 x 24" table, 6" dia. cyl. 750 lbs. cap. @ 80 lbs. pressure.

HERMAN BUMPERS

60 x 72" table, 15,000 lbs. cap. @ 80 lbs. press., 19½" dia. cyl.
50 x 50" table, 6100 lbs. cap. @ 80 lbs. pressure.
40 x 50" table, 6400 lbs. cap. @ 80 lbs. press., 13" dia. cyl.

MISCELLANEOUS MOLDING MACHINES

Tabor power jolt, power roll-over, power draw, 30 x 40" roll-over table, 12" pattern draw.

Osborn jolt roll-over, 21 x 28" jolt table, 16 x 43" roll-over table, 19" dia. cyl. 8-10" draw, stationary.

Pridmore hand draw, air roll-over and electric jolt, 33 x 25" table, direct connected to 2 HP GE 3/60/220V AC Induction Motor.

JOLT SQUEEZE & POWER STRIP

Nicholls 11-32" Type "D" stationary 13-23" pin centers, 10¼" squeeze piston, 4¾" jolt piston.
No. 142 Milwaukee, stationary, stripping cap. 1200 lbs. @ 80 lbs. press., draw 6" table 19 x 35"—open end type.
No. 152 Milwaukee, portable, max. pattern draw 6", pattern length 28" width 20", 1200 lbs. cap. @ 80 lbs. press., 22 x 30½" table.
No. 703-6 Osborn jolt squeeze and strip, 21 x 28" table, stationary, length of opening in lifting frame 34", 6" pattern draw, 8" cyl. dia. 1000 lbs. jolt. cap. @ 80 lbs. pressure, distance from lifting frame to squeeze head 24¼", flask length 44½", with roll off conveyor.
No. 703-5 Osborn, same as above excepting 17 x 35" table.

JOLT SQUEEZE STRIP

Milwaukee No. 113, portable, 500 lb. cap. @ 80 lb. press. 6" pattern draw, 16" x 26" table —platen size 12" x 14"—max. pattern length 24".
Milwaukee No. 113, portable, 500 lb. cap. @ 80 lb. press. 6" pattern draw, 16" x 35/ table, open end type, platen size 12" x 14".

JOLT SQUEEZERS

No. 276-J Osborn, portable, squeeze cyl. dia. 13"—18 x 26" table.
No. 275-J Osborn, portable, squeeze cyl. dia. 10"—16 x 20" table.
Nicholls, 10-32" stationary, swing-out rod type, adjustable head.

International "HJ" jar ramming, turn-over draw, 13 x 17" table, 4" draw, portable.

POSITIVE PRESSURE BLOWER

No. 6 W-B positive pressure BLOWER, cap. 7000 CFM displ. 29 cu. ft. per rev. complete with 40 HP 220V AC Lincoln Motor and Control.

OVERHEAD ELECTRIC TRAVELING CRANES

25-ton Walker 55 ft. span with 5-ton Aux. cage control, motors 550V DC, chain on main hoist and cable on Aux. girders single web construction, truck ends steel wheels.

10-ton Northern 37' 6" span, cab control, 3-motor type, 3/60/220V AC, vertical clearance 56", end clearance 6½".

7½-ton Bedford, 55 ft. span, 2-motors, 220V DC, cab control (same as 3-motor type, Trolley Travel and Hoist-same motor, by means of clutch).

5-ton Bedford, 28 ft. span, Straight "I" Beam Type Girders, cab control, 220V DC Motors, cut steel pinions and gears.

5-ton Shepard 18'5" span, 1-motor 220V DC, trolley hand racked, bridge hand racked, box girders.

2-ton Detroit LoHed Ice House Type, 26 ft. span, 3-motors, 220V AC, floor control, 9-10 ft. lift.

1-ton Detroit LoHed Type "H" Ice House Cranes, 29 ft. span, double "I" Beam Girders, 220V AC, floor control, 9 ft. vertical lift.

ELECTRIC HOISTS

1000 lb. Shepard, 1 HP 110V DC Motor, with Trolley, 14 ft. lift.

2000 lb. Y&T Model 20B Elec. Chain Hoist, 16 ft. lift, 220V AC Motor, floor cont.

2000 lb. Shepard equipped with 2¼ HP 110V DC Motor, 18 ft. lift, floor cont.

2000 lb. Shepard Lift-A-Bout with Trolley, 2¼ HP 110V DC Zobell Motor, 18 ft. lift, floor control, speed 20 FPM.

2000 lb. Northern Hi-Lift lug suspension type for fixed suspension, with 2 HP 220V AC Motor, 20 ft. lift.

2-ton Shepard, stationary, with remote cont. for mounting, with 20 HP 220V AC Motor—speed 80 FPM.

5-ton Detroit, with Top Hook, floor cont. with 5 HP 230V DC Motor.

7½-ton DETROIT equipped with 6½ HP Watson 230V DC Motor.

SAND MIXERS-CONDITIONERS-THROWERS

No. 1, 4 ft. dia. Simpson, single muller type, pulley drive.

No. 2, 6 ft. dia. Simpson, double muller type, pulley drive.

No. 3, 8 ft. dia., 11 x 32" heavy duty type double Mullers, arranged for motor drive, but without motor, with gear reduction and outboard bearing.

Model "B" Royer Sand Separator and Blender, cap. 300 lbs. sand per min., portable, with AC Motor.

Model "D" Royer Sand Separator and Blender, 800 lbs. sand cap. per min., portable with 3/60/220V AC Motor.

Pangborn SANDBLAST ROOM Type NF, O/A outside dim. 12' wide, 7' deep and 7' high with double doors in the front each 3'6" wide, complete with perforated floor plates, hopper, screw conveyor, bucket elevator, sand separator, storage tank and 220V AC Motor.
Also outside self-supporting Dust Arrestor, 4-hopper type with self-contained Fan House, with Fan and Motor.

EXHAUST TYPE TUMBLING BARRELS

Sly 36" dia. x 60" long ROUND TYPE, complete with Clutch, Brake, Speed Reducer direct connected to 10 HP GE 3/60/220V AC Motor.

34 x 34 x 48" SQUARE TYPE (in line or sell individually) driven from tight clutch pulley with Sly Clutches.

Above items represent but a portion of our used or reconditioned FOUNDRY and INDUSTRIAL EQUIPMENT BARGAINS . . . Send for our current STOCK LIST No. 69 (just printed) which shows COMPLETE STOCK on hand at our CHICAGO WAREHOUSE and advise as to your exact requirements.

SCULLY-JONES & COMPANY **(Foundry Division) 19th & ROCKWELL STS. PHONE LAWNDALE 8770 — CHICAGO, ILLINOIS**

Index to Advertisers

Abrasive Co. 27
Adams Co. 36
Ajax Flexible Coupling Co. 140
Ajax Metal Co. 150
Alloy Metal Abrasive Co. 165
American Air Filter Co., Inc. 106
American Bridge Co. 163
American Colloid Co. 127
American Foundrymen's Association 30, 31
American Foundry Equipment Co., The 54, 55, 135, 142
American Gum Products Co. 177
American Monorail Co., The 81
American Optical Co. 24
American Steel Abrasives Co. 169
Arcade Manufacturing Co. 173

Bartlett, C. O., & Snow Co. 47
Bay State Abrasive Products Co. 44
Beardsley & Piper Co., The 108, 109
Berkshire Mfg. Co. 172
Bethlehem Steel Co. 1
Blaw-Knox Div. of Blaw-Knox Co. 182
Brooke, E. & G., Iron Co., The 167
Buehler, Adolph I. 164
Buffalo Wire Works Co., Inc. 178

Campbell-Hausfeld Co., The 141
Cannon Vibrator Co. 172
Carborundum Co., The 42
Carl-Mayer Corp., The 113
Carman, Edwin S., Inc. 168
Chain Belt Co. 14
Champion Foundry & Machine Co. 8, 9
Chicago Pneumatic Tool Co. 52
Chicago Tramrail Co. 132
Clearfield Machine Co. 49
Cleveland Chaplet & Mfg. Co. 170
Cleveland Pneumatic Tool Co., The 51
Cleveland Quarries Co. 183
Climax Molybdenum Co. 83
Columbia Steel Co. 163
Combined Supply & Equipment Co., Inc. 181
Cunningham, M. E., Co. 178
Curtis Pneumatic Machinery Division of Curtis Manufacturing Co. 179
Cut Steel Abrasive, Inc. 160

Davenport Machine & Foundry Co. 45
Dayton Oil Co. 149
Dayton Pneumatic Tool Co. 169
Demmler, Wm., & Bros. 134, 183
Desmond-Stephan Mfg. Co. 182
Despatch Oven Co. 48
Detroit Electric Furnace Division Kuhlman Electric Co. 145
Diamond Clamp & Flask Co. 50
Dietert, Harry W., Co. 179
Dolese & Shepard Co. 163
Dougherty Lumber Co. 165
Dreisbach Engineering Corp. 176

Eastern Clay Products, Inc. ..... Front Cover
Electro-Chemical Pattern & Mfg. Co. 183
Electro Metallurgical Co. 15

Fairway Laboratories, Div. G. S. Suppiger Co. 182
Fanner Manufacturing Co., The 25
Federal Foundry Supply Co., The 2, 121
Fisher Furnace Co. 157
Foundry Equipment Co., The 90, 91
Foundry Services, Inc. 158
Fox Grinders, Inc. 165

Galland-Henning Mfg. Co. 138
Gardner-Denver Co. 38
Gehnrich Corporation, The 154
General Blower Co. 174
General Electric X-Ray Corp. 18, 19
Great Western Mfg. Co. 176

Hammond Machinery Builders, Inc. 172
Hardy Sand Co. 20
Hauck Manufacturing Co. 168
Haws Refractories Co. 166
Haynes Foundry Equipment Co. 139
Hercules Powder Co., Inc. 79
Herman Pneumatic Machine Co. 17
Houghland & Hardy, Inc. 20
Hydro-Blast Corp. 40, 41

Illinois Testing Laboratories, Inc. 174
Industrial Equipment Co. 181
Ingersoll-Rand 43
International Molding Machine Co. 87
International Nickel Co., Inc., The 75

Jackson Iron & Steel Co., The 181
Jefferson Machine Tool Co. 170
Johns-Manville Corp. 143

Koch, George, Sons, Inc. 169

Lanly Co., The 151
Lawrence Clay Co. 173
Link-Belt Co. ..... Back Cover

McCann Furnace Co. 21
McCormick, J. S., Co. 136
McKenna Metals Co. 171
McLain's System, Inc. 170

Macklin Co., The 12
Maehler, Paul, Co., The 88
Mahr Mfg. Co., Div. Diamond Iron Works, Inc. 26
Mall Tool Co. 183
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc. 167
Marathon Chemical Co. Div. of Marathon Paper Co. 22
Mathews Conveyer Co. 85
Mathieson Alkali Works (Inc.) ..... Inside Front Cover
Midwest Foundry Supply Co. 156
Miller, Herbert F., Jr. 183
Milwaukee Chaplet & Mfg. Co. 130
Milwaukee Foundry Equipment Co. 24, 25
Modern Equipment Co. 103
Moline Iron Works 162
Molybdenum Corp. of America 124
Morton Salt Co. 183

National Engineering Co. 10, 11
New Haven Vibrator Co. 171
North American Manufacturing Co., The 53
Norton Co. 123

Ohio Ferro-Alloys Corp. 39
Oliver Machinery Co. 180
Osborn Manufacturing Co., The 97, 98

Pangborn Corporation 6, 7, 129, 181
Parsons Engineering Corp. 153
Peerless Tools, Inc. 183
Picker X-Ray Corp. 127
Pioneer Mfg. Co. 181
Pittsburgh Crushed Steel Co. 173
Pittsburgh Lectromelt Furnace Corp. 181
Plaster Process Castings Co. 176
Pollard Oil Products Co. 180
Porbeck Manufacturing Co. 171
Producers Core Sand Corp. 183
Pulmosan Safety Equipment Corp. 155

Radium Chemical Co., Inc. 177
Ransohoff, N., Inc. 105
Republic Steel Corp. 56
Riehle Testing Machine Division of American Machine & Metals, Inc. 175
Rietz Lumber Co. 160
Robeson Process Co. 177
Robins Conveying Belt Co. 147
Roots-Connersville Blower Corp. 146
Royer Foundry & Machine Co. 13
Ruemelin Mfg. Co. 154

Schneible, Claude B., Co. 93
Schundler, F. E., & Co., Inc. 23
Scientific Cast Products Corp., The 180
Scully, Jones & Co. 164, 187
Seymour & Peck Co. 159
Simonds Worden White Co. 163
Simplicity Engineering Co. 148
Sly, W. W., Mfg. Co., The 95
Smillie, C. M., & Co. 166
Smith Facing & Supply Co. 152
Smith, Werner G., Co., The 4, 5
Smooth-On Manufacturing Co. 167
SPO, Inc. 32
Standard Conveyor Co. 133
Stearns Magnetic Manufacturing Co. 128
Steel Conversion & Supply Co. 182
Steel Shot & Grit Co. 173
Sterling Grinding Wheel Co., The 119
Sterling Wheelbarrow Co. 46
Stevens, Frederic B., Inc. ..... Inside Back Cover
Stow Manufacturing Co., Inc. 175
Syntron Co. 168

Tabor Manufacturing Co. 28
Tamms Silica Co. 155
Tannewitz Works, The 144
Thomas & Proetz Lumber Co. 172
Titanium Alloy Mfg. Co. 16
Truscon Steel Co. 137

Union Carbide & Carbon Corp. 15
United Compound Co. 160
United States Graphite Co. 33
U. S. Steel Corporation and Subsidiaries 163
U. S. Steel Export Co. 163

Vanadium Corp. of America 29
Vonnegut Moulder Corp. 157

Wadsworth Core Machine & Equipment Co. 177
Wellman Engineering Co. 178
Western Tool & Mfg. Co., The 171
Whiting Corporation 115, 116
Wickland, A. A., & Co. 156
Wilson, Lee, Sales Corp. 37
Woodward Iron Co. 77

Table of Contents, Page 3

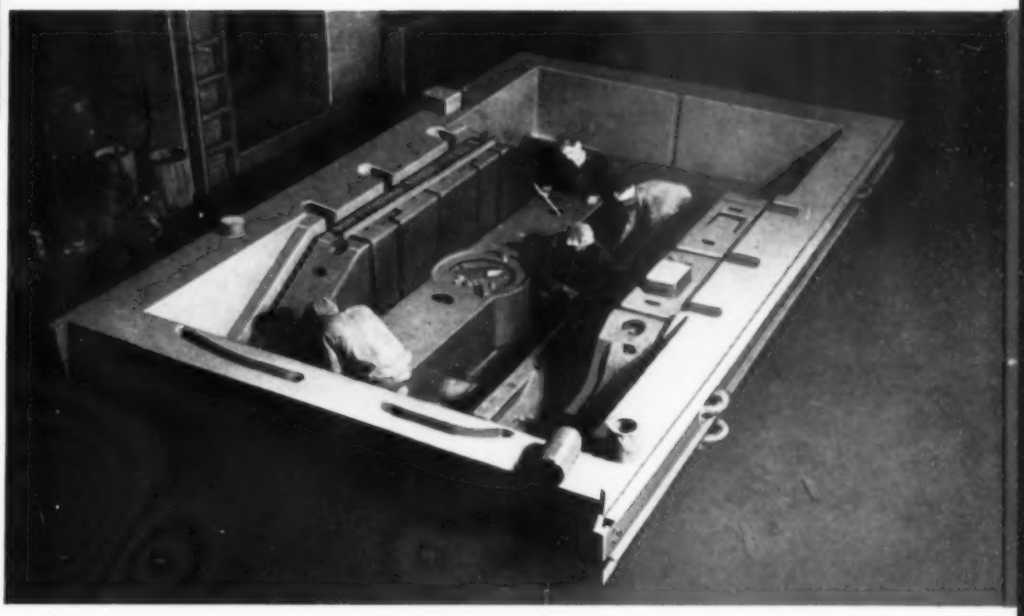
Refer to alphabetical list of products in "Where-To-Buy" pages, beginning on Page 161.

Classified Advertisers, Pages 184, 185, 186, 187

STEVENS FOUNDRY FACINGS

First Line of Defense

Against Defective Castings



STEVENS CORE WASH

All cores in the mold illustrated were coated with Stevens 180-D —one of the many excellent grades highly recommended by users.

For better values, specify Stevens Core Wash.

STEVENS (EAST INDIA) *CEYLON* PLUMBAGO

Stevens famous Ceylon Plumbago—still available—for how long no one knows. Other grades to suit conditions. Describe your class of work and we will send a sample or a barrel on approval.

STEVENS CORE PASTE

Select from three grades. High Temperature withstands 3100 F. —does not weaken in moist air. No. 3. air dries in a few hours: "Regular", the old standby.

STEVENS PARTING COMPOUNDS

Among well known trade names are COLUMBIA tripoli Parting. SNO-WHITE non-silica Parting. MOL-DUST lime-free Parting and STEVENS LIQUID Parting—One of these will be just right for your job.

STEVENS CARBON BLACKING (CORE WASH)

This popular core wash is often imitated—never equalled. Also gives excellent results when used as a wet blacking or as a green sand facing. Order a barrel on approval.

★ ★ ★ ★ ★ ★

Stevens Facings excel wherever the going is tough

FREDERIC B. STEVENS, INC.

Detroit, Michigan

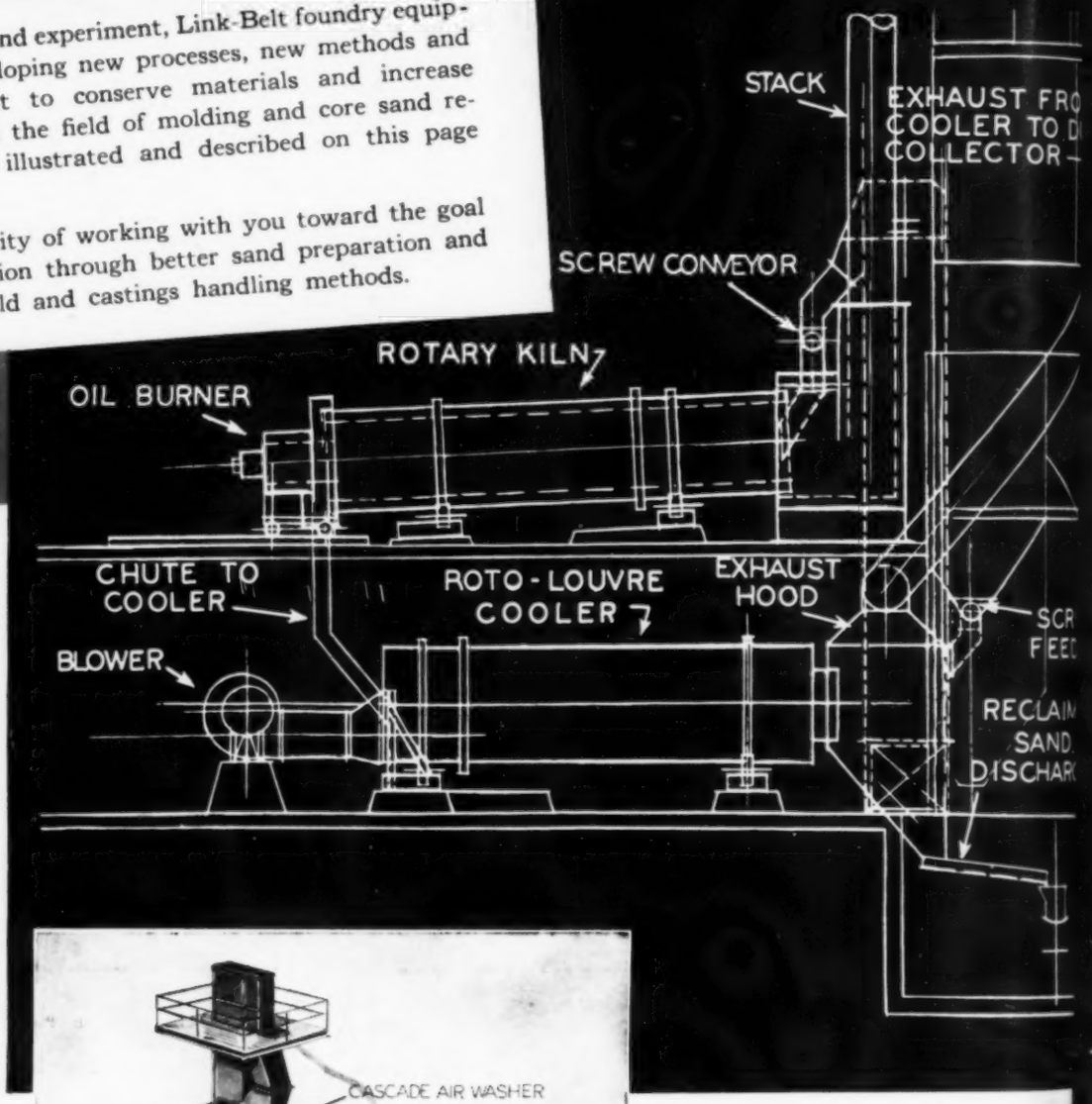
- NEW ENGLAND . . . . 166-182 Brewery St., New Haven, Conn.
- NEW YORK and PENNSYLVANIA . . 93 Stone St., Buffalo, N. Y.
- INDIANA . Hoosier Supply Co., 36 S. Cruse St., Indianapolis, Ind.
- CANADA . . Frederic B. Stevens of Canada, Limited
- 1262 McDougall St. . . . . Windsor, Ontario
- 2368 Dundas St. West . . . . . Toronto, Ontario

NEW Developments

In Molding and Core Sand Reclamatio

Through continuous research and experiment, Link-Belt foundry equipment engineers are ever developing new processes, new methods and better mechanical equipment to conserve materials and increase efficiency and production. In the field of molding and core sand reclamation, the two systems illustrated and described on this page are typical.

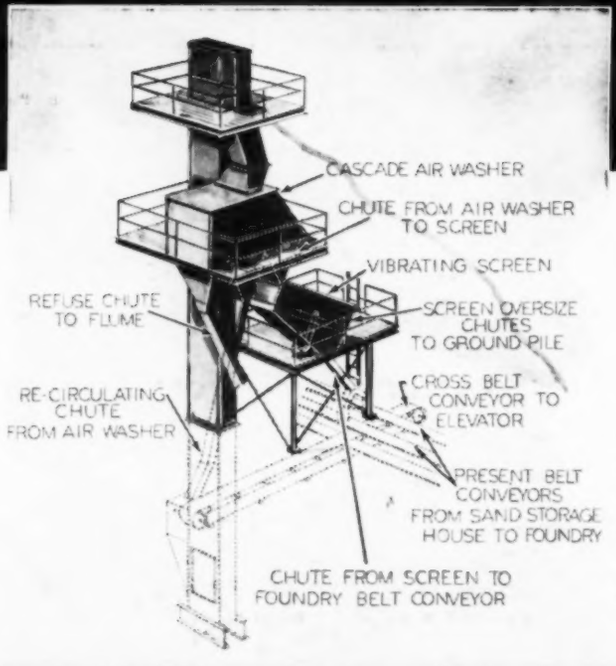
We welcome the opportunity of working with you toward the goal of speeding defense production through better sand preparation and reclamation, core, sand, mold and castings handling methods.



High Temperature Process with Rotary Kiln and Cooler

(Patents Pending)

This is a new and revolutionary process of renovating and reclaiming used foundry sand. In actual performance it has produced a product as clean and at times cleaner, than the original sand. The method consists essentially of granulating the sand lumps and heating to temperatures which remove carbonaceous and other foreign material and then cooling for reuse. Let us tell you more about the advantages of this new method.



← Mechanical Screenin in Combination with Air Classificatio

The drawing to the left is of a recent Link-Be installation in a steel foundry where the form practice required a large consumption of ne sand for new sand facing. This handling a preparation unit is recovering for reuse a hi percentage of this new sand through prop screening and air classification of the shakeo sand heap.

LET'S GO! U.S.A. · KEEP 'EM FLYING!

LINK-BELT COMPANY

Chicago Philadelphia Indianapolis Atlanta
Dallas San Francisco Toronto

Offices, warehouses and distributors in principal cities

8750

LINK-BELT Sand Preparation EQUIPMENT